सत्यमेव जयते

THE SEVENTH FIVE YEAR PLAN

1985—90

VOLUME II

SECTORAL PROGRAMMES OF DEVELOPMENT

GOVERNMENT OF INDIA
PLANNING COMMISSION
NEW DELHI

OCTOBER 1985

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COMMUNITY HEALTH CELL
47/1 St. Mark's Road, Bangalore – 560 001

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India

step-up over the Sixth Plan outlay of Rs. 4.13 crores which was provided for a pilot exercise in eight States. The Central Sector provision for IREP programme is Rs. 5.91 crores, which would be utilised for staff support to the States; for training and orientation programmes including a training centre; and for monitoring, setting up computer information system and documentation.

INVOLVEMENT OF VOLUNTARY AGENCIES

2.114 There is a good deal of voluntary effort in India, especially in the field of social welfare. The tendency so far has been to equate the work of voluntary agencies with only welfare activities and charity work. Involvement of other agencies in the non-government sector, such as trade unions, cooperatives and Panchayati Raj bodies, has tended to blur the identity of those which can be strictly defined as voluntary organisations. There has been inadequate recognition of their role in accelerating the process of social and economic development. These agencies have been known to play an important role by providing a basis for innovation with new models and approaches, ensuring feedback and securing the involvement of families living below the poverty line. Therefore, during the Seventh Plan, serious efforts will be made to involve voluntary agencies in various development programmes, particularly in the planning and implementation of programmes of rural development. Voluntary agencies have developed expertise and competence in many non-traditional areas to plan their own schemes instead of expecting Government to do so. More specifically, the role of voluntary agencies in the implementation of development

(i) To supplement government effort so as to offer the rural poor choices and alternatives;

(ii) To be the eyes and ears of the people at the village level;

(iii) To set an example. It should be possible for the voluntary agency to adopt simple, innovative, flexible and inexpensive means with its limited resources to reach a larger number with less overheads and with greater community participation.

(iv) To activate the delivery system and to make it effective at the village level to respond to the felt needs of the poorest of the poor;

(v) To disseminate information;

(vi) To make communities as self-reliant as possible;

(vii) To show how village and indigenous resources could be used, how human resources, rural skills and local knowledge, grossly underutilised at present, could be used for their own development.

(viii) To demystify technology and bring simpler form to the rural poor;

(ix) To train a cadre of grassroot worke believe in professionalising voluntee

(x) To mobilise financial resources from the community with a view to makin munities stand on their own feet;

(xi) To mobilise and organise the po generate awareness to demand quali vices and impose a community syst accountability on the performance of v level government functionaries.

2.115 Voluntary agencies are essentially non- and non-partisan organisations. The criteria for i fying voluntary agencies for enlisting help in rel to the rural development programmes can b follows:

(i) The organisation should be a legal entity

(ii) It should be based in a rural area and working there for a minimum of 3 year

(iii) It should have broad-based objectives ving the social and economic needs of community as a whole and mainly weaker sections. It must not work for pr but on 'no profit and no loss basis'.

(iv) Its activities should be open to all citiz of India irrespective of religion, caste, cre sex or race.

(v) It should have the necessary flexibility, pr fessional competence and organisation skills to implement programmes.

(vi) Its office bearers should not be elected men bers of any political party.

(vii) It declares that it will adopt constitutiona and non-violent means for rural developmen purposes.

(viii) It is committed to secular and democratic concepts and methods of functioning.

2.116 In order to assist and support voluntary agencies in the implementation of anti-poverty and Minimum Needs Programme, there is need for a consolidated approach in the field of social welfare and social services, that is, for conventional voluntary agencies, there is already the Central Social Welfare Board with their State branches. For integrated rural development and allied services covered by the anti-poverty and Minimum Needs Programme in the Seventh Plan period there is need to enlarge the function and scope of People's Action for Development (India) : PADI.

2.117 The accent in the Seventh Plan will be to professionalise volunteerism, to introduce professional competence (delinked from degrees) and managerial expertise in keeping with the resources and capabilities of voluntary agencies to be in a position to meet the

...requirements of government in terms of account-... Voluntary agencies, however, will need to ... greater attention to mobilise locally available ... and financial resources, identify people in the ... and vulnerable occupations like farmers, rural ... scheduled castes and scheduled tribes, agri-... labourers, girijans and bonded labourers, up-... their skills and give them the tools to make ... economically self-sufficient as well as produc-...

2.118 There has to be mutual trust and under-... between government and voluntary agencies ... village level. If at the higher levels there is ... indifference to voluntary agencies, at the ... level there is often open hostility. For want ... established forum where voluntary agencies ... be given an opportunity to explain their ... and defend themselves or bring field ... to the notice of the State Governments, the ... that now prevails is not conducive to full ... of voluntary agencies.

2.119 The need to establish a regular forum was ... during the Sixth Plan period when the late Prime Minister in October 1982 wrote to all the Chief Ministers that Consultative Groups of voluntary agencies must be established at the State level. It is hoped that during the Seventh Plan period such Consultative Groups will be established in all States and given operational responsibilities. It is proposed that at the Central level, voluntary effort in the rural development sector with its allied services is promoted on a much larger scale with greater responsibilities through PADI and such other bodies as may be established. The State level Consultative Groups recommended by the late Prime Minister headed by either the Chief Secretary or the Development Commissioner should be registered under the Societies Registration Act as Peoples Action for Development (PAD).

2.120 For voluntary effort to succeed, guidelines will be formulated to minimise delays and harassment by frequent reference of project proposals to various government (Central and State) departments|agencies. PAD should prepare a panel of experts available in the voluntary sector in different States|districts who are prepared to assist on a professional and consultancy basis in the planning and implementation of anti-poverty and minimum needs programmes through voluntary agencies. There are officials in the Central and State Governments who are keen to offer their services and experience to upgrade professionalism in the voluntary sector. Suitable steps will be taken to facilitate this. Professional and consultancy services to voluntary agencies could also include those by retired personnel and ex-servicemen.

2.121 The programmes and areas in which the participation of voluntary agencies can be of great help for better implementation of anti-poverty and minimum needs programmes are :

(i) Integrated Rural Development|Rural Landless Employment Guarantee Programme| TRYSEM;
(ii) Implementation of land ceiling and distribution of surplus land;
(iii) Enforcement of minimum wages to agricultural labourers;
(iv) Identification and rehabilitation of bonded labour;
(v) Development of scheduled castes and scheduled tribes;
(vi) Supply of safe drinking water : repair and maintenance of water supply systems with Community support ;
(vii) Afforestation social forestry, development of biogas and alternative energy sources (solar and wind energy, improved chulas);
(viii) Promotion of family planning;
(ix) Primary health care; control of leprosy, TB, blindness; preventive health programmes using village resources;
(x) Programmes for women and children in rural areas;
(xi) Innovative methods and low-cost alternatives in elementary, primary and middle school education for children, adult education and non-formal and informal education;
(xii) Consumer protection : promotion of co-operatives;
(xiii) Promotion of handicrafts and village and cottage industries;
(xiv) Promotion of science and technology;
(xv) Legal education;
(xvi) Rural housing : improvement of rural slums;
(xvii) Environmental and ecological improvement; and
(xviii) Promotion and encouragement of traditional media for dissemination of information.

2.122 The human resource available in the training infrastructure of voluntary agencies need to be mobilised and used more effectively at the village level in the Seventh Plan period. The non-formal and informal skills, methods and approaches of building confidence among the rural poor to undertake responsibilities of planning and implementing programmes on their own, that training institutions in the voluntary sector have developed, needs to be considered for replication on a larger scale.

2.123 There is need for voluntary agencies to decide on a code of conduct to be applicable to those

agencies receiving government funds.

2.124 It is proposed that about Rs. 100—150 crores of Plan expenditure in the Central and State sectors on the programmes listed above may be earmarked for use in active collaboration with voluntary agencies. This involvement could take many forms. In certain cases a programme or some of its components could be implemented directly by the voluntary agency in a specified area. In certain oth they could participate in the process of planning mobilisation, monitoring and evaluation and b assisted by suitable grants-in-aid. These and ot modalities of involvement would vary from case case but the intention is to ensure that the financi target given above is realised on a national scale.

TABLE 2.5

Summary Table of the Outlays for Rural Development Programmes Centre, States and UTs

(Rs. crores)

(1)	Seventh Plan Outlay			
	Total	Centre	States	UTs
	(2)	(3)	(4)	(5)
Integrated Rural Development and Related Programmes	3473.99	1864.38*	1609.61	—
National Rural Employment Programme	2487.47	1250.81	1236.66	—
Community Development and Panchayati Raj Institutions	416.15	—	396.30	19.85
Special Employment Programmes	509.24	—	509.24	—
Rural Landless Employment Guarantee Programme	1743.78	1743.78	—	—
Land Reforms	395.83	36.71	353.88	5.24
Integrated Rural Energy Programmes	47.76	5.91	37.15	4.70
TOTAL :	9074.22	4901.59	4142.84	29.79

*Includes Rs. 245 crores for Desert Development Programme.

CHAPTER 11

HEALTH AND FAMILY WELFARE

11.1 Human resources are a country's most precious endowment. The success of a Plan depends on the extent to which human resources are developed in terms of education, skills, health and well-being. India is a signatory to the Alma Ata Declaration (1978), whereby it is committed to achieving "Health For All by 2000 AD". The programmes initiated and executed over the last three decades have strengthened the health care system in the country and yielded considerable dividends, particularly in the field of communicable diseases. Measures have been initiated to correct the regional imbalances prevalent within the system, to improve referral services and to augment health-care services in the rural areas through the Minimum Needs Programme (MNP).

11.2 Life expectancy at birth has gone up from 27.4 years from the 1941—51 decade to an estimated 54.71 years in 1985-86, while the infant mortality rate has come down from 146 per thousand live births during the fifties to 110 in 1981. The health infrastructure has been strengthened considerably. The country has presently about 83,000 sub-centres, 11,000 primary and subsidiary health centres and 650 community health centres. This infrastructure is supported by curative and specialist care facilities provided by the sub-divisional|tehsil|district and teaching hospitals, and the regional and national institutes.

11.3 The per capita expenditure on health incurred by the State has gone up from about Rs. 1.50 in 1955-56 to Rs. 27.86 in 1981-82. Plague and smallpox have been eradicated. Mortality from cholera and related diseases has decreased. The modified plan of operation initiated in 1976 under the National Malaria Eradication Programme (NMEP) brought the disease under control to a considerable extent though of late there has been seen some resurgence in its incidence. Significant indigenous capacity has been established for the production of drugs and pharmaceuticals, vaccines, sera and hospital and other equipment.

REVIEW OF HEALTH PROGRAMMES IN SIXTH PLAN

11.4 One of the most significant things happened during the Sixth Plan was the adopti the National Health Policy by both Houses of P ment. Health Care Programmes were restruc and reoriented towards this policy. Priority was to extension and expansion of the rural health structure through a network of community centres, primary health centres and sub-centres, liberalised population norm. Efforts were ma develop promotive and preventive services, alon curative facilities. High priority was given t development of primary health care located as to the people as possible.

Minimum Needs Programme

11.5 Under the minimum needs progra population norms have been revised to one sub- for 5,000 population, one primary health cent 30,000 and one community health centre with basic specialities for a population coverage of 10 In some States, particularly in the north-easte gion, a relatively liberalised norm was necessa view of their dispersed population and d terrain. Priority has been accorded to steppi training capacity of auxiliary nurse mi (ANMs) and other para-medicals, keeping in the manpower requirements.

11.6 The targets set, the likely achievemen the position emerging in the last year of the Five-Year Plan are given in Table 11.1.

11.7 Shortage of construction materials cement and steel and in some States short trained doctors, nurses, ANMs and other para cals were impediments in the achievement targets. To overcome these, the intake of AN training was increased and sub-centres establis public or rented buildings. Full financial ass was provided to the States to train para personnel.

TABLE 11.1

Progress in Rural Health Infrastructure-Sixth Plan (1980-85)

Sl.	Programme	Number in 1979-80	Sixth Plan target (additional)	Likely achievement during 1980-85	Likely cumulative [illegible]
1	2	3	4	5	
1.	Sub-Centres	47517	40000	35309	
2.	Primary Health Centres including subsidiary Health Centres	7399	1600	3702	
		249	174	400	

Multi-purpose workers' Training

11.8 The training of uni-purpose health workers into multipurpose functionaries has not progressed satisfactorily. This programme is the mainstay of the rural health services, which ensures an integrated approach to the delivery of health and family welfare services for the rural population. Lack of rationalisation of the pay scales of the multi-purpose functionaries by the States has been a serious impediment to the successful progress of the Scheme. Population norms for the posting of multi-purpose workers have not been generally followed. The training programmes of uni-purpose health workers scheduled for completion by 1984-85 are likely to spill over into the first year of the Seventh Plan in many States.

Control of Communicable Diseases

11.9 *Malaria* : After its resurgence, a modified plan of operation was introduced in 1976 to effectively control malaria. The incidence of malaria, which stood at 75 million cases in 1954 had, by the end of the Sixth Plan come down to less than 2 million cases. The number of deaths also came down steeply from the initially estimated level of 750,000 due to direct causes and another 750,000 due to indirect causes, to a few hundred. The incidence of malaria has increased in some States, mainly in Orissa, Gujarat, Tamil Nadu. Higher incidence of P. falciparum infection was noticed in many new areas. Lack of adherence to scheduled spraying operations on scientific lines, management failures, biological resistance of vectors and parasites, and inadequate provision of resources are some of the underlying reasons for the resurgence of the disease in the late 60's and early 70's.

11.10 *Leprosy* : The National Leprosy Control Programme has been further augmented and converted into a National Leprosy Eradication Programme, based on the strategies and policies formulated by a high level committee. 350 million people living in areas of the country where the disease is endemic have been covered under the programme. A total of 3 million cases are under active treatment against an estimated 4 million leprosy affected patients. The Sixth Plan target of 90 per cent case detection could not thus be fully achieved.

11.11 *Tuberculosis* : Tuberculosis continues to be a major health problem. Control operations against this disease were augmented considerably by ensuring the required quantities of quality anti-TB drugs and equipment. The programme to detect and bring under treatment new TB cases was stepped up. Examination of sputum at the Primary Health Centre level is being pursued with vigour, on a target oriented basis. This is backed by a network of 358 district TB Centres, 300 TB clinics and 45,000 TB beds in the country. The programme has picked up considerably. Far greater efforts are still needed to control the disease. The VIth Plan target to raise the number of cases detected from 30 per cent to 50 per cent has been partially realised.

11.12 *Blindness control* : Ophthalmic care facilities at various levels of infrastructure have been augmented under the national programme for control of blindness and prevention of visual impairment. It was targeted to reduce the prevalence rate of blindness from 14 per 1,000 in the year 1980-81 to 10 per 1,000 by 1984-85. There is no feedback on the degree of achievement. Under the target-oriented cataract operations programme initiated in 1981-82, over 3 million cataract operations were performed upto the end of 1984-85. Critical shortage of ophthalmic assistants and ophthalmic surgeons and poor functioning of the mobile teams are some of the basic impediments to faster progress.

11.13 *Guinea-worm eradication programme* : Two active case searches were conducted in 1984 in the seven endemic States of Andhra Pradesh, Karnataka, Gujarat, Madhya Pradesh, Maharashtra, Rajasthan and Tamil Nadu. The independent appraisal of the programme conducted in 1985 considered Tamil Nadu as free from disease as no indigenous case of guinea-worm had been reported from that State during the previous three years. During 1985—90, active case search, provision of safe water supply in the affected villages, chemical treatment of drinking water, health education of the community and management of cases by use of bandages will continue.

11.14 *Other communicable diseases* : For control of filaria, sexually transmitted diseases and diarrhoeal diseases, efforts are being gradually strengthened. Most of the concerned control programmes suffer from poor management and monitoring. During the Seventh Plan, these areas will be appropriately strengthened.

11.15 *Secondary and tertiary care* : Curative care facilities in the existing network of hospitals and dispensaries, under the administrative control of the Central Health Ministry and of the States and UTs have also been organised to the extent possible. Financial support is provided to the establishment of post-graduate institutions, with provision for super-specialities on a regional basis, so as to meet the needs of the population as close to their habitation as possible. Referral linkages are weak and need strengthening.

Reorientation of Medical Education

11.16 The scheme for re-orientation of medical education (ROME) was introduced with the objectives of (i) introducting community bias in the training of undergraduate medical students with emphasis

on preventive and promotive services, (ii) reorientation of the role of medical colleges, so that they became an integral part of the health-care system and did not continue to function in isolation, (iii) reorientation of all faculty members so that hospital-based and disease-oriented training was progressively complemented by community-based and health-oriented training for providing comprehensive primary health care, and (iv) the development of effective referral linkages between PHCs, District Hospitals and Medical Colleges. The scheme has been implemented in its first phase, in about 106 medical colleges. In spite of a one-time grant-in-aid of about Rs. 16 lakhs to each of the participating institutions, the objectives of the scheme could not be achieved to the desired extent. This was largely due to (i) lack of commitment to the programme at all levels, (ii) slow progress in the utilisation of Central funds, and (iii) absence of efforts in the restructuring of teaching and training programmes at the college levels.

Medical Research

11.17 Medical research covers a broad spectrum of discipline, from basic work at the frontiers of modern biology to innovations for ensuring the most effective application of available knowledge. Medical research is carried out principally under the auspices of the Indian Council of Medical Research (ICMR). A detailed account of the work done under the ICMR is given in Chapter 17. A considerable amount of research work is also being carried out in the other institutions, some under the Ministry of Health and Family Welfare (including those under the DGHS). Some of the institutions which have done notable work are the National Institute of Communicable Diseases, All India Institute of Medical Sciences, New Delhi, Post-Graduate Institute, Chandigarh, National Institute of Mental Health & Neuro Sciences, Bangalore, and All India Institute of Hygiene and Public Health, Calcutta. Many medical colleges in the country also have an excellent record of research to their credit.

Indian Systems of Medicine

11.18 The Indian Systems of Medicine had been given due importance during the Sixth Plan. They are popular in the country and there are about 4.5 lakhs practitioners of these systems. Most of them are working in far flung rural areas. Attemps are being made to use them for providing meaningful primary health care services and strengthening the national health programmes. Teaching and training programmes for Ayurveda, Siddha, Unani, Naturopathy, Yoga and Homoeopathy have been augmented and streamlined. Separate councils of education and research have been established for the various systems of medicine. Financial assistance was provided to programmes of research, standardisation of drugs and production of medicine.

SEVENTH PLAN—OBJECTIVES, GOALS AND STRATEGY

11.19 The nation is committed to attain the goal of health for all by the year 2000 AD. For developing the country's vast human resources and for the acceleration and speeding up the total socio-economic development and attaining an improved quality of life, primary health care has been accepted as one of the main instruments of action. Primary health care would be further augmented in the Seventh Plan. In the overall health development programme, emphasis will be laid on preventive and promotive aspects and on organising effective and efficient health services which are comprehensive in nature, easily and widely available, freely accessible, and generally affordable by the people. Towards this objective, the major thrusts will be in the following areas :

(i) The Minimum Needs Programme would continue to be the sheet-anchor for the promotion of the primary health measures, with greater emphasis on improvement in the quality of services rendered and on their outreach. These will be backed up by adequately strengthened infrastructural facilities, and establishment of additional units where they are not available.

(ii) Health programmes suffer considerably because of poor inter-sectoral coordination and cooperation. Serious efforts for effective coordination and coupling of health and health-related services and activities, nutrition, safe drinking water supply and sanitation, housing, education information and communication and social welfare will be made as part of the package for achieving the goal of Health for All by

(iii) Community participation and people involvement in the programme is of critical importance, programmes involving participation of voluntary organisations the mounting of a massive health movement would be accorded

(iv) Qualitative improvements in Health and Family Planning supplies and logistics require education and training programmes be made more need-based and oriented and, since management vision are vulnerable areas information systems need to

Adequate provision of essential drugs, vaccines and sera need special attention for ensuring production, pricing and distribution and universal accessibility, availability and affordability.

(v) Urban health services, school health services and mental and dental health services also need special efforts to ensure comprehensive coverage.

(vi) For the control and eradication of communicable diseases, programme implementation at all levels needs strengthening, with strict adherence to the sharing of the costs of the programme by State Governments. The National Goitre Control Programme has not achieved much, and needs to be implemented vigorously as it has the potential of quick and complete success.

(vii) Cancer, coronary heart diseases, hypertension, diabetes, and traffic and other accident are emerging as major health problems in the area of non-communicable diseases. There is need to initiate appropriate action for their control and containment. Several of these diseases are susceptible to control as regards incidence through primary and secondary preventive measures. Development of specialities and super-specialities will need to be pursued, with proper attention to regional distribution.

(viii) Training and education of doctors and paramedical personnel needs a thorough overhaul. Teaching and learning have to be related to the health problems of the people. Medical training must be need-based, problem-centred and community-oriented. Health manpower development has been a neglected field which needs urgent attention and action. Medical education is a life-long process and continuing education is essential. Health management support and supervision is an area that needs considerable strengthening by a proper selection, training, placement, promotion and posting policy. Health management experience and expertise for all categories of health and health-related managerial jobs will have to be ensured.

(ix) Medical research of special relevance to the common health problems of the people, would be pursued. Evaluation of intervention and technologies will be given greater emphasis and priority. Modern biology and biotechnology will receive special attention in order to find more effective and acceptable tools to fight several of the endemic diseases. Research efforts in the area of immunological approaches to fertility control, immunodiagnostics, operational research, and effective utilisation of electronics and computers in the health programmes will be pursued. There is an urgent need for evolving an effective and efficient management information system (MIS) for proper planning, implementation and evaluation of health services.

(x) The Indian systems of medicine lend themselves to better standardisation, integration and wider application, particularly in the national health programme. Teaching, training and research and service activities in the development of the Indian systems of medicine would need to be pursued vigorously. Extension planning in this sector is essential.

Programme Thrusts in the Seventh Five-Year Plan

11.20 *Rural health programmes*: The approach and strategy for developing health care delivery system in rural areas initiated in the Sixth Plan would be pursued vigorously, with stress on the following aspects :

(i) Programmes formulated and executed in the Seventh Plan would aim at consolidation of the health infrastructure already developed, by making up deficiencies in respect of trained personnel, equipment and other physical facilities.

(ii) The three-tier system of sub-centres, primary health centres (PHC) and community health centres (CHC) would be further strengthened by converting the existing maternity and child health (MCH) centres and rural dispensaries into PHC's and sub-district hospitals into CHCs and by setting up new functional units wherever necessary. Construction works would be taken up in areas where rented buildings are not easily available. Low-cost models of housing for health centres would be adopted to the extent possible.

(iii) The multi-purpose workers (MPW) scheme would be extended, with emphasis on training for ensuring attitudinal changes and developing the required skills among them. Effective deployment of trained personnel and the resolution of administrative problems, e.g., connected with rationalisation of pay scales, is important.

(iv) Efforts would be made for complete integration of the organisational set-up under

health, family welfare and MCH programmes. Financial integration towards the objective of funding all the services as a package programme under a common budget head will also be attempted by the States and the Centre Delegation of adequate administrative and financial powers in order to integrate health organisations would be necessary for speedy and effective execution of approved Plan programmes.

(v) Measures for encouraging community participation in the programme will be encouraged. Village Health Committees need to be activised. The block and district level panchayats would be fully involved in the planning, organising and running of health services. Greater participation by voluntary organisations in the provision of health care delivery services in rural areas would also be promoted.

(vi) The State sector Minimum Needs Programme would be further strengthened by the following programmes—some on-going and some new-under the Central Sector :

(a) Village Health Guides Scheme.
(b) Establishment of Sub-centres
(c) Basic training of para-medical and para-professionals required for rural areas.
(d) Augmentation of laboratory facilities, and
(e) Orientation-training, integrated health management information system, supply of manuals, kits and other education material as part of multi-purpose workers' scheme.

The physical achievements under the health programmes by the end of the Sixth Plan and the targets set for the Seventh Plan are given in Annexure 11.1.

11.21 *Health care services in urban areas.*—In recent years the urban population has been growing at a very high rate. In its wake, urbanisation is gradually creating serious health problems. The existing urban health services are under pressure, services in the slum areas being most vulnerable and inadequate. There are multiple agencies providing health services in urban areas, but poor coordination among them results in duplication and inefficiency of services. Poor sanitary conditions in urban slums continue to create favourable conditions for disease transmission and health hazards for not only the slum population but of the entire urban population. There is urgent need for a coordinated, organised, integrated urban development programme which would include proper health services as an essential and integrated part.

11.22 Medical and health care facilities in the urban areas will be further augmented in the [illegible] Five Year Plan in consonance with the [illegible] provided in the National Health Policy. The [illegible] ing would be in the directions in which [illegible] be taken :

(i) The network of hospitals needs to be further strengthened gradually towards the objective of one hospital bed for every [illegible] population, taking into account the [illegible] pital facilities available, voluntary [illegible] sations and other private institutions [illegible] pital beds should be distributed [illegible] so as to provide adequate support to [illegible] mary health care services. This would be done by allocating about 15 per cent of total beds for primary health centres, 25 per cent for the first referral, i.e., in community health centres and sub district [illegible] pitals, 40 per cent for the district [illegible] hospitals and 15 per cent for medical college hospitals, regional hospitals, specialised hospitals, and super-specialities. Specialities need to be deployed appropriately along with beds and other facilities.

(ii) Appropriate administrative steps will be taken to curb the tendency to divert health personnel from rural areas and to deploy them in urban areas.

(iii) The organisation of family welfare and primary health care services in urban areas could be brought under the supervision of medical colleges in collaboration with the local health authority in the towns where they are located. Medical students/interns/postgraduates could be actively involved in the organisation of these services.

(iv) Voluntary organisations and local bodies need to be encouraged to undertake responsibility for family welfare and primary health care services in a more systematic manner.

(v) Considering the fact that the urban health services organisation, besides providing primary health care to the urban population, has also to provide back-up support to the rural health organisation through the referral system and specialist services, the need is clear for district hospitals to be provided with specialised services in important branches such as surgery, obstetrics and gynaecology, medicine, psychiatry, paediatrics, ophthalmology, anaesthesia, ENT, skin, rehabilitation and dental care. District hospitals would have to provide diagnostic facilities in X-ray, ECG, pathology and biochemistry, including facilities for

early detection of cancer. Each district hospital should also have specialists in radiology and pathology including blood transfusion. At district levels there is need to establish epidemiological centres with a well-equipped public health laboratory to keep the morbidity and mortality profiles of the district under constant surveillance, detect disease outbreak early and take necessary corrective action.

(vi) In order to meet the needs of the most vulnerable sections of the population, conscious efforts need to be made to ensure 40 per cent of all beds for children and mothers. This group not only constitutes two-third of the population but also is the most vulnerable to disease and subject to relatively high morbidity and mortality.

(vii) Considering that the facilities for specialised treatment in the country are limited, and not available in all regions in equal measure, efforts have to be made to bridge critical gaps, and also rectify the regional imbalances through strengthening of specialised institutions and super-specialities in areas where serious deficiencies exist.

(viii) Organised referral services are almost non-existent. To optimally use the existing scarce specialist facilities, all institutions providing specialised services should be declared as referral institutions so that they attend only to cases referred from the first and second levels of referral services. It is further recommended that any individual seeking the services of specialised institutions directly should be made to pay the full cost for such services.

Control of Communicable Diseases

11.23 Communicable diseases account for more than two-thirds of the total morbidity and mortality in the country. Programmes for their control and eradication would be further intensified on the following lines :

(i) Innovative measures and appropriate technology would be introduced to strengthen the on-going control/eradication programmes to ensure benefits to a larger segment of the population. These include integrated Vector Control Programmes with peoples' active participation.

(ii) The primary health care system would be optimally utilised for delivering comprehensive frontline care and for better disease surveillance and control.

(iii) Health education component of all disease control programmes would be accorded high priority to enlist individual as well as community support

(iv) Control/eradication programmes could be made effective only through inter-sectoral collaboration in the areas of industry housing, water supply, sanitation and environment. Measures needed to bring forth this coordination would be accorded priority.

(v) National and regional programmes to identify new and emerging health problems and the strategies for their control and eradication will be taken up.

11.24 Malaria.—The modified plan of operations for control of malaria initiated in 1976 would need to be reviewed in depth to ensure necessary technological and operational changes, besides intensifying malaria control in urban areas.

11.25 Leprosy.—Under the national leprosy eradication programme, priority would be assigned to consolidating the gains through effective utilisation of the vast infrastructural network already set up. The stress would be on the introduction of available modern technology to significantly reduce transmission, backed up by measures to promote health education and economic rehabilitation of leprosy patients. Priority would also be assigned to enlist community participation and the aid of voluntary organisations in the programme.

11.26 Tuberculosis.—Optimum utilisation of the existing network of district TB Centres and beds besides the establishment of additional units where needed for further extension would be the main planks of the national TB control programme. Provision of essential X-Ray and laboratory equipment would also be ensured under the programme towards the objective of increasing the detection rate to 2 million new cases per annum against the present detection rate of 1.2 million cases per annum. Steps would be taken to provide extensive health education, produce health education material and to involve the community and medical and para medical personnel in the programme. In respect of both tuberculosis and leprosy, enduring efforts have to be made to ensure early detection and compliance with therapy.

11.27 Blindness control.—The programme thrusts and strategies already initiated under the national scheme for the control of blindness and prevention of visual impairment would continue in the Seventh Plan. The objective of reducing the overall incidence of blindness to 10 per thousand by the terminal year of the Seventh Plan with potential for further reduction to 5 per thousand by 2000 AD will be pursued. Steps to overcome the deficiencies in infrastructure, monitoring and evaluation, conduc-

tion of eye camps, etc. would also form an important part of the programme.

Control and Contrainment of Non-Communicable Diseases

11.28 Non-communicable diseases also contribute significantly to morbidity and mortality in the country and their share will increase with rising life expectancy. There has been hitherto no systematic attempt to measure the extent of their prevalence to take counter measures. Isolated schemes exist for the detection treatment and control of these diseases in urban areas, generally as part of the overall health care development programme. Efforts will now be made to quantify the magnitude of incidence and prevalence and the following measures will be initiated to test intervention strategies :

11.29 Pilot Projects.—Pilot projects will be initiated in selected places to develop a comprehensive programme of action with emphasis on preventive action and facilities for controlling diabetes, hypertension, ischemic heart disease (IHD), rheumatic heart disease (RHD) and respiratory infections. The intervention strategy would be innovative in character, with emphasis on health education for raising people's awareness of these diseases. The possibility of training village health guides and other paramedicals with supporting availability of certain essential drugs at the primary health care level for first level treatment will be explored. An integrated approach to non-communicable disease control which is cost-effective has to be developed. Human behavioural factors impinging on health will need special attention.

11.30 Cancer.—The on-going cancer research and control facilities would be augmented, with increased participation by the States under the programme. Priority will be assigned to promote prevention and early detection. Medical colleges will be developed to function as a link between the Regional Cancer Centres and the peripheral health infrastructure.

11.31 Mental health.—Organised and planned mental health care activities are vital for obviating the ill-effects of major socio-economic changes. A beginning in this direction is proposed in the Seventh Plan by according priority to strengthening the existng psychiatry departments, promotion of community sychiatry by provision of drugs and services through ht primary health care system and organisation of raining programmes.

11.32 Dental care.—The twin problems of perental disease and caries need to be addressed on a ational footing. Pilot projects would be taken up provide basic dental care facilities and to organise ounselling at primary health care level. An objective of these pilot projects would also be to develop organised dental health care facilities as an integral part of the school health services.

11.33 Goitre|ido.—The iodine deficiency disea control programme will be mounted on an extens scale in the Seventh Plan through coordination the activities of all the concerned agencies. The p mary thrust of the programme would be iodisati of all edible salt on a time-bound basis so as to e sure availability of iodised salt to the communi throughout the country by the terminal year of t Seventh Plan.

Blood Bank and Transfusion Services

11.34 Organised blood-bank and blood transfusion services will be further developed with the active participation of the Centre, the States and voluntary organisations. Alongside attempts will be made to ensure quality control|standards and to organise the required training for medical and para-medical personnel.

11.35 Other Programmes.—The prevalence of preventable disability in the country is unacceptably high. Preventive and prophylactic programmes, such as immunisation against polio and vitamin 'A' prophylaxis will be pursued vigorously. Simple, accessible and affordable rehabilitation technologies are needed.

11.36 The rising incidence of accidents including the high prevalence of burns, calls for a vigorous programme of prevention, treatment and rehabilitation. The high incidence of industrial hazards and accidents, highlighted by the Bhopal gas tragedy, underscores the urgency of developig an adequate Industrial Health Service. This calls for coordinated and effective monitoring and surveillance of the environment within and around industrial locations.

Medical Education

11.37 *Undergraduate education.*—In view of the increasing unemployment of medical graduates and also the imbalance in the ratio of doctors to paramedical workers, establishment of new medical colleges or increase in the intake capacity of the existing institutions is not suppported as a matter of policy. This position would continue in the Seventh Plan period also. Priority would, however, be accorded to improving the quality of training and making it need-based and community-centred.

11.38 The Reorientation of Medical Education (ROME) scheme would be restructured to ensure its successful operationalisation towards the objectives of active involvement of medical institutions in the promotion of primary health care and imparting training to undergraduates, preferably in rural com

munity set-up.

11.39 *Postgraduate education.*—Postgraduate medical education in the basic and broad specialities would be rationalised with a view to removing imbalance and make it need-based and community-oriented. Postgraduate training facilities in public health, community medicine and health management would need to be substantially increased so that health managers can benefit from such training. Development of specialised institutions and training in superspecialities would be encouraged in the public and the private sectors.

Training and Manpower Development

11.40 Priority would be assigned to promoting continuing education facilities to all categories of staff. Supportive training and on-the-job training would be strengthened as an essential element of continuing education. Secondly, training of para-professionals and auxiliary personnel would be accorded high priority to meet the community health services requirement. Efforts will be made to correct imbalances and improve quality. An attempt will be made to direct vocationalisation of 10+2 stream of education to develop these functionaries. Thirdly, the possibility of establishment of universities of Health Sciences with the objective of linking all the training centres and institutions functionally on State, regional and national levels will be explored. Fourthly, efforts will be made to encourage States to participate fully in their own manpower development activities. District-level planning will be introduced towards realising the objective of promotion of the decentralised planning process. Establishment of health manpower planning and development bureaus, etc., will be accorded special attention.

Medical and Health Services Research

11.41 Research efforts in several problem area initiated through the thrust areas and task-force approach in the Sixth Plan would be further intensified. Priority would also be assigned to enlarge the scientific basis of preventive medicine and health promotion. Development of immunodiagnostic tests to facilitate the study of epidemiology of common diseases and their control will receive priority. Development of linkages between biomedical research system and the health care system with special attention to promotion of research in immunology, molecular biology, genetics and genetic engineering will be emphasised. Development of health services research and augmentation of information and communication would continue to receive high priority.

11.42 The programme areas that will be accorded high priority in the Seventh Plan within the framework of the above approach would relate to the following :

(a) In the field of communicable diseases controlled clinical trials to improve chemotherapy regimes for treatment of tuberculosis and leprosy, besides operational research to improve detection of cases and case holding would be accorded priority. R&D support for the National Malaria Eradication Programme would be intensified. Simple sensitive and specific tests for detection of subclinical leprosy would be encouraged. Studies on the genetic aspect of drug resistance, development of immunodiagnostic tests for detection of filaria specific antigens, development of appropriate methodologies for prevention and control of virus diseases and vaccine development programmes would be the other priority areas in this field.

(b) In the field of family planning, the focus would be on increasing the availability and improving the acceptability of the existing methods of contraception and on the phased introduction of longacting injectables and subdermal implants in the field of spacing methods. Operational research for development of integrated package of MCH, family planning and nutritional services through evaluation of appropriate modules would also be accorded priority, in addition to studies to improve the system of delivery of primary health care. Efforts would be intensified to develop an immunological agent for fertility control.

(c) In the field of non-communicable diseases, the thrust areas in research would be in consonance with the programme details identified for implementation in the Seventh Plan.

11.43 The Indian Council of Medical Research would continue to play a pivotal and coordinating role in medical research. The All India Institute of Medical Sciences, New Delhi ; the Post-Graduate Institute, Chandigarh; National Institute of Communicable Diseases, Delhi ; AIH & PH, Calcutta ; JIPMER Pondicherry, etc., would be supported in a coordinated way in consonance with priorities assigned at the national level.

Indian System of Medicine and Homoeopathy

11.44 Popularisation and development of Indian system of medicine in Ayurveda, Unani, Siddha, Yoga and Naturopathy as well as of Homoeopathy would be taken up more vigorously in the Seventh Plan. The majority of the practitioners of these systems of medicine live in the rural areas and enjoy

high local acceptance and respect. They consequently exert a considerable influence on health beliefs and practices among the rural population. Measures to enable each of these systems to develop in accordance with its own genius will receive priority. Concerted efforts would be made to dovetail the functioning of these systems and integrate their services at appropriate levels into the overall health care delivery system, particularly the national health programmes and the programme of primary health care. Separate Central Councils for the various Indian systems of medicine would continue to guide the activities in regard to promotion of research, undergraduate and postgraduate education curricula and promotion of health care delivery system, etc.

11.45 The Central sector and Centrally-sponsored schemes will be related to setting up standards for postgraduate|undergraduate education, development of postgraduate education, standardisation of drugs and monitoring the availability of raw materials for the production of drugs. The State Plan schemes will continue to deal with the delivery of health care, undergraduate education, production of drugs, etc.

Drug Control and Medical Stores Organisation

11.46 Measures initiated for balancing demand and supply of essential and life-saving drugs, strengthening of vaccine production units, rationalisation of the pattern of drug production, import and distribution systems for promoting the objective of primary health care, etc., would be strengthened in the Seventh Plan. The drug industry is poised for rapid growth. This places further responsibility on both the Central and State level drug-control administration responsible for regulating the qulity of drugs. The Central and State organisations would, therefore, need to be adequately strengthened in the Seventh Plan period. Zonal offices of the Central Drug Control Organisation, Central Drug Laboratory, Calcutta, and the Central Indian Pharmacopoea Laboratory, Ghaziabad, which function as appellate laboratories under the Drugs and Cosmetics Act and assist the States, also need to be strengthened and properly equipped.

11.47 In view of its vital role and added responsibilities in furthering the promotion of health care and family welfare programmes, the Medical Stores Organisation would be appropriately strengthened on the following lines :

(i) improvement and expansion of storage facilities;

(ii) strengthening, improving and modernising quality control at Government Medical Depots;

(iii) improvement and modernising of existing manufacturing facilities;

(iv) strengthening and expanding the personnel components of Medical Stores Organisation and

(v) establishing a sound inventory control system and rationalisation of the system of accounting with the aid of computers.

Prevention of Food Adulteration

11.48 The Prevention of Food Adulteration (PFA) Act has been on the Statute Book since 1954. Its enforcement, however, has many shortcomings. These relate to (i) inadequacies in post-harvest handling and storage facilities, including unhygienic and insanitary environment and food-handling practices, (ii) lack of quality control in processing, (iii) large distribution of unpacked food in bulk and retail sale, (iv) infrastructural deficiencies such as lack of qualified and trained food inspectors, inadequacy of well-equipped laboratories, absence of advisory and extension services, inadequates in programming and in planning quality control activities, and inadequate monitoring information system and community involvement.

11.49 To achieve the objective of providing wholesome food to consumers, further measures on the following lines with adequate budgetary support are contemplated in the Seventh Plan :

(i) augmentation of existing infrastructural food control services at the Central level for proper coordination, monitoring and evaluation;

(ii) establishment of an inspection and investigation unit and laboratory for coordinating the activities of the States; curbing inter-State adulteration and checking quality of imported foods in defferent zones;

(iii) strengthening of Central Food Laboratories, which function as referral laboratories under the provisions of the PFA Act and also undertake research and standarisation work;

(iv) augmentation of the State Governments efforts for strengthening the existing food laboratories and for creating spot testing facilities;

(v) motivating State Governments to create consumer awareness through co-operation with voluntary organisations by means of audio-visual aids, etc; and

(vi) helping the State Governments to make available library facilities to technical personnel working under the programme.

11.50 The main thrust in the Seventh Plan will be on monitoring, evaluation and surveillance through

better coordination and guidance.

Health Education, Information, Education and Communication (IEC)

11.51 Progress made so far in the promotion of health education is far from satisfactory. Schemes to strengthen health education bureaus, training of medical and para-medical personnel in health education etc., would continue to be implemented with added emphasis. Efforts in the Seventh Plan would be basically directed to develop and strengthen health education as an essential component of health services in the country. This will be supported by adequate budgetary provision. Measures would be initiated to actively involve social and preventive medicine as well as community medicine departments of the medical colleges, to strengthen health education training programmes for medical teachers, para-medical personnel etc. Organisation of School Health Education activities as an integral part of formal and non-formal education, would need to be developed through appropriate measures.

11.52 Efforts will be made for the active use of different types of media to create awareness among the people and motivate them to utilise health services and to adopt healthful practices. Behaviorial sciences research (to study human behaviour) for wider expansion of health education, will be encouraged.

Outlays

11.53 The total outlay for the Health Sector is Rs. 3392.89 crores. The outlays for the Central, State and Union Territories Plans under the Health Sector are shown in Annexures 11.1 and 11.2. There also include provision for the States share of Centrally-Sponsored Schemes. The indicative targets for Primary Health Care Programme are given in Annexure Annexure 11.3.

FAMILY WELFARE

11.54 The family welfare programme occupies an important position in the socio-economic developmental plans. It plays a crucial role in human resources development and in improving the quality of life of our people. It forms an essential and integral part of the 20-point Programme which stresses the need for the promotion of "family planning on a voluntary basis as a peoples' movement".

11.55 The country's population which was about 342 million at the time of Independence rose to 361 million in 1951. It was 439 million in 1961. It further increased to 548 million in 1971. The 1981 Census shows that India's population was 685 million, almost double the figure (342 million) at the time of Independence.

11.56 India was the first country in the wo have a government-level programme of family w and planning. It became an integral part of eco planning right from the Frst Five Year Plan, 195 The beginning was modest, with a largely clinica proach. The services were being extended to who sought the services on their own. Over the cessive Plans, greater emphasis and larger ou have been provided to strengthen the programm received an extension education orientation in 1 In 1966 the programme was consolidated, expa and extended, and a new Family Planning Depart was created in the Ministry of Health. However, programme received a setback during the y 1977—79. The effective couple protection rate, w touched a figure of 23.7 per cent in 1976-77, slip down to 22.5 per cent in 1979-80, the beginnin the Sixth Five Year Plan.

Review of the Programme during the Sixth Plan

11.57 *Objectives of the Sixth Plan* : A Wor Group on Population Policy was set up by the P ning Commission in 1979. This Group recommen the adoption of the long-term demographic goa reducing the Net Reproduction Rate (NRR) to 1 the year 1996 for the country as a whole and by 2 in all the States. The implications of these long-t demographic goals were spelt out as follows :—

(i) The average size of the family would reduced from 4.2 children to 2.3 childre

(ii) The birth rate per 1000 population wo be reduced from the level of 33 in 1978 21.

(iii) The death rate per 1000 populatinon wo be reduced from about 14 in 1978 to 9 a the infant mortality would be reduced fr 129 to 60 or less.

(iv) As against about 22 per cent of the eligil couples protected with family planning, per cent would be protected by the ye 2000 AD.

If these goals are achieved; the population of Ind would be around 950 million by the turn of the ce tury and stabilise at 1200 million by the year 20 AD.

11.58 Keeping in view the long-term demograph goals, (reducing NRR to 1 by 1996, as approved b the National Development Council), the followi targets were envisaged for the Sixth Plan, keeping i view past performance, available capacity and futu potential :

Sterilization	22 million (later raised t 24 millon)
IUD	7.9 million
CC Users	11 million in the terminal year 1984-85

Effective couple protection 36.6 percent

11.59 *Strategy for the Sixth Plan* : Limiting the growth of population was one of the main objectives of the Sixth Plan. This had to be achieved through education of the people to adopt a small family norm voluntarily, backed by appropriate programmes of supplies and services. The family planning and welfare programmes had to be made a part of the total national effort at providing a better quality of life. The Plan sought to make a massive attack on the problems of unemployment and poverty through specific programmes directed towards the weaker sections of society. Special attention had to be paid to the education and employment of women to liberate them from dependence and insecurity, thus improving their social status, and at the same time changing their attitudes.

11.60 The Sixth Plan emphasised that the family planning and welfare programme must rise above all controversies and should be accorded high priority. It was reiterated that the programme would not be the sole responsiblity of any one department of the Government but the responsibility of Government as a whole. The role of extension education, motivation and involvement of official and voluntary agencies was stressed. Health, Family Welfare and Nutrition programmes directed towards the vulnerable population—mothers and children—were vigorously pursued.

11.61 *Performance during the Sixth Plan* : Against a target of 24 million sterilisations by the end of the Sixth Plan, a little over 17 million sterilisations had been carried out. Against the target of 7.9 million IUD insertions, about 7 million IUD insertions were done. Against a target of 11 million CC users during the year 1984-85 about 9.31 million CC users were enrolled in the programme during the year 1984-85.

11.62 A critical analysis of the above performance highlights the following features :

(i) Achievements fall short of the targets, particularly in the sterilisation programme. The performance in respect of IUD insertions and CC users reached a high level, around 80 per cent and above.

(ii) The effective couple protection acheived by March 1985 with the above performance is of the order of 32 per cent which means that the effective couple protection has been raised by 10 percentage points, i.e., from 22 to 32 per cent but it is still below the Sixth Plan target of 36.6 per cent.

(iii) In the first two years of the Sixh Plan, couple protection rose roughly by 0.5 per cent and 1 per cent, respectively, whereas during the last three year of the programme, the couple protection has steadily risen about 2.5 per cent each year.

11.63 The performance analysis also reveals t the national averages are substantially lowered cause of the relatively poor performance in the Sta of Uttar Pradesh, Bihar and Rajasthan. It may mentioned here that these three States which accou for a sizeable population of the country have a cou protection rate of less than 20 per cent—Utt Pradesh 16.7 per cent, Bihar 16.8 per cent and Raja than 19.3 per cent against the national average of per cent. Madhya Pradesh and West Bengal have couple protection rate of 29 per cent. Special effor for raising the couple protection rate are, therefor necessary in these five States.

11.64 The Family Welfare programme is integrate with the Health programme, especially Maternal an Child Health (MCH) The performance of the MC programme during the Sixth Plan, particularly in th field of immunization and ante-natal care, is far fro satisfactory. Measures for strengthening the pro gramme and increasing the child survival rate are es sential for the success of the programme.

11.65 The highlights of the Family Welfare prog ramme are :

(i) It is estimated that the crude birth-rate ha declined by about 8 points in about 1 years—from 41 per 1000 population i 1966 to 33 in 1982, i.e., 0.5 percentage point average decline per year.

(ii) The programme seems to have averted 60 million births since its inception until end— March 1983. It is estimated that the programme implemented in 1983-84 might avert 11 million potential future births.

(iii) By the end of 1984-85 about 32 per cent of all eligible couples were effectively protected by family planning methods.

11.66 Most of the States|UTs showed better family planning performance than before the Sixth Plan. The pick up was, however, uneven among the States. Among the major States, the effective couple protection rate increased by 17.9 percentage points in Punjab, by 12.2 per centage points in Maharashtra and 9.9 percentage points in Haryana during the first four years of the Sixth Plan (1980—84). All these are much above the national average increase of 6.6 percentage points. The increase in Madhya Pradesh (5.9 percentage points) and West Bengal 6.0 percentage points) was a little below the national average. The major States showing an increase in couple protection rate (CPR) of less than 4 percentage points during this period are Assam (1.7), Bihar (3.5), Tamil Nadu (3.5), U.P. (3.6) and Andhra Pradesh (3.8)

Of the other States, Tripura (—0.5) and Meghalaya (—0.9) registered a decline in CPR. Among Union Territories, the performance of Dadra and Nagar Haveli, Chandigarh, Pondicherry and Andaman & Nicobar Islands was quite satisfactory. The increase in the couple protection rate in Lakshadeep (1.2) and Delhi (1.7) was rather poor.

11.67 The shortfalls in the achievements under the programme could be attributed to :

(i) Lack of infrastructure facilities;
(ii) relatively high targets;
(iii) less than optimal use of available resources;
(iv) political, solial, economic and cultural constraints;
(v) high infant mortality rate, which has declined only moderately from around 125 during the 70's to 114 in 1980; it is still too high for couples to feel confident of survival of their children; and
(vi) the levels of maternal and child mortality are still very high compared to that in other countries.

11.68 Against the Sixth Plan allocation of Rs. 1078 rores (inclusive of Rs. 68 crores transferred from the lealth Sector for Village Health Guides Scheme), ie likely expenditure in the Sixth Plan is around s. 1448 crores.

eventh Plan Programmes and Perspective

11.69 In the light of the progress made in the ini- l years of the Sixth Plan, the health policy targeted a net reproduction rate of 1 by the year 2000 Ad; a review, however, indicates that this goal would be reached only by the period 2006-2011. The Family Welfare Programme envisages the following goals for the year 1990 :

(i) Effective couple protcection rate	42 per cent
(ii) Crude birth rate per thousand population	29.1 per cent
(iii) Crude death rate per thousand population	10.4 per cent
(iv) Infant mortality rate per thousand population	90 per cent
(v) Immunisation	Universal coverage
(vi) Ante-natal care	75 per cent

11.70 To reach the above targets, particularly 42 per cent couple protection, the Seventh Plan stipulates 31 million sterilisations by its close, 21.25 million IUD insertions and, during the terminal year, 14.5 million CC Users. Seventh Plan Targets for Family Planning Methods.

11.71 The target of 42 per cent CPR by the end of the Seventh Plan can be reached provided the rate of increase in CPR of 2 percentage points annually is maintained. This is an enormous task in view of the increasing number of eligible couples and the need to compensate for the increasing number of cases of attrition amongst the past acceptors. On an average, 3 million couples are expected to join the reproductive group every year. Determined efforts will, therefore, be necessary to keep the CPR rising. The targets to be reached regard to different methods in the Seventh Plan are given in Table 11.2.

TABLE 11.2
Required Acceptors of Family Planning Methods

(Numbers in lakhs)

riod	Sterilisations	IUD	CC users and OP users	Increase in CPR (Per cent)
85-86	55.0	32.5	105	From 32 per cent in April 1985 to 42 per cent in March 1990
86-87	60.0	37.5	1.15	
87-88	62.5	4[illegible].5	125	
88-89	65.0	47.5	135	
89-90	67.5	52.5	145	

1.72 Taking into consideration the realities of the ation, different sets of targets have to be fixed different States, both in terms of level of CPR to be attained and in terms of the method-mix of the acceptors. The year by which NRR of 1 to be attained by different States is shown in Table 11.3.

TABLE 11.3
Date of reaching NRR—1 State-wise

up 'A' (1991-92)	Population as per 1981 Census (million)	Group 'B' (1996-97)	Population as per 1981 Census (million)	Group 'C' (2000-02)	Population as per 1981 Census (million)
1	2	3	4	5	6
hra Pradesh	53.35	Assam	19.90	Bihar	69.91
arat	34.09	Karnataka	37.14	Jammu and Kashmir	5.99

1	2	3	4	5	6
Haryana	12.92	Madhya Pradesh	52.18	Rajasthan	34.26
Himachal Pradesh	4.28	Orissa	26.37	Uttar Pradesh	110.86
Kerala	24.45	West Bengal	54.58	Manipur	1.42
Maharashtra	62.78	Andaman & Nicobar Islands	0.19	Meghalaya	1.34
Punjab	16.79			Nagaland	0.77
Tamil Nadu	48.41	Dadra and Nagar Haveli	0.10	Sikkim	0.32
Chandigarh	0.45	Goa, Daman and Diu	1.09	Tripura	2.05
Delhi	6.22			Arunachal Pradesh	0.63
Pondicherry	0.60	Mizoram	0.49	Lakshadweep	0.04

Note : Categorisation has been done on the basis of couple protection rate reached as in April 1983.

Seventh Plan Family Welfare and MCH Strategies

11.73 For attaining the long-term goal of reaching NRR=1 by 2000 AD, a suitable strategy of implementation of the programme must be designed taking into account the differential CPR achieved by different States, with attention being concentrated on those where it is low, particularly the Group 'C' States in the above table which account for about 33 per cent of the total population.

11.74 Targets for family planning, particularly sterilisation, are being achieved by special drives and camps. There is need to develop the programme on a sustained and continued basis. Laparascopic sterilisation has become very popular and availability of laparascopes and trained personnel has to be stepped up. Much greater effort will have to be mobilised for implementation of the programme relating to IUDs, oral pills and conventional contraceptive users. Imaginative and innovative measures will have to be adopted for spreading the use of conventional contraceptives and oral pills and steps need to be taken to make them freely and widely available, through an effective social marketing mechanism.

11.75 To achieve the national long-term demographic goals, educating and enlightening people on the benefits of late marriage and its social enforcement will have to be greatly emphasised. Special programmes and incentives oriented towards eligible couples, particularly in the younger age-groups, are needed. Incentives for attracting couples with two children and younger age-groups are necessary.

11.76 Inter-sectoral coordination and cooperation and the involvement of voluntary agencies in the programme will be necessary in this programme to an even greater extent than in health. Community participation is essential for the voluntary acceptance of the Family Welfare programme. Identification and active involvement of non-governmental organisations and of informal leaders in the community and imparting to them the necessary training to motivate and to participate in the programme are important aspects of efforts in this field.

11.77 For the achievement of the "two child" norm, it is essential that the child survival rate in our country is enhanced. The infant mortality rate of 114 per 1000 is staggeringly high and unacceptable. Here also, there are wide inter-State differences, with some States having done remarkably well, e.g., Kerala, in lowering infant mortality, while others lag far behind, e.g., UP and Bihar. As more than half of the infant mortalities are in the neo-natal period, the meternity and child health programme (MCH) will have to be considerably strengthened. The MCH component of training of medical and para-medical needs to be carefully planned and implemented. The associated areas of child immunisation, nutrition and control of communicable diseases in infants will need special attention and strengthening. For immunisation, the 'cold chain' still poses a big problem, which needs to be solved. Diarrhoeas are still among the major causes of infant child mortality, and ORS therapy needs to be used in a more effective manner. Acute respiratory infections too constitute a major risk, and they also require to be tackled.

11.78 Vigorous steps will have to be taken to reduce maternal mortality. More than two-thirds of the women in the rural areas are still being attended to at childbirth by untrained Dais and there is, therefore, need to augment the Dais training programme.

11.79 Activities and aspects in the Family Planning programme on which stress will be specially needed in the Seventh Plan are the following :—

(i) The efficiency and effectiveness of the programme infrastructure will have to be improved.

(ii) Within the overall framework, greater flexibility will have to be provided to each State with respect to programme inputs.

(iii) Greater emphasis will be needed on spacing methods of increasing the couple protection rate, especially of the younger age-

group.

(iv) Special Information, Education and Communication (IEC) campaigns would need to be organised to remove the bias against girl children.

(v) Efforts will be made for propagation and enforcement of the law relating to the minimum age of marriage.

(vi) States which have the lowest couple protection rate would need special attention. Similarly, within States, areas and groups with lower acceptance rate will have to be given particular attention. The programme would have special focus on urban slums, backward and tribal areas, as well as the rural poor.

(vii) A special programme will have to be undertaken for cities with population over 10 lakhs in order to achieve a much higher couple protection rate.

(viii) Involvement of voluntary organisations in the programme has played a significant, though limited, role so far. There is need to provide greater support and encouragement to such voluntary effort. The existing schemes for providing assistance to voluntary organisations will, therefore, be strengthened and continuous efforts will be made to streamline the mechanism for implementing these schemes. More innovative schemes would be developed to secure further involvement of voluntary organisations. For this purpose, substantially enhanced allocations have been made. There is also need to give more support and encouragement to voluntary organisations in rural areas. Success of these schemes requires close interaction between the Government and voluntary organisations. Therefore, special cells would be created at the Central and State levels to coordinate with voluntary organisations. An Advisory Committee representing non-governmental organisations (NGOs) may be attached to the Ministry of Health and Family Welfare so that the involvement of NGOs could be developed and further promoted.

(ix) Experience has shown that involvement of women's groups and youth groups in some common social and economic activities is quite useful in promoting the family welfare programme. Village Health Committees and Mahila Mandals would be actively involved in family planning propagrammes in all villages. Some initial financial assistance could be given to them to implement their schemes. This will prove to be a very effective step in making this a people's programme.

11.80 Some State Legislatures have passed unanimous resolutions in support of the family welfare programme. This form of political commitment enhances the credibility of the programme and boosts the morale of those engaged in the family planning field. It is desirable that similar resolutions be adopted in the remaining State Legislatures.

11.81 The network of programme services has been expanded considerably in different Five Year Plans, but it has not yet reached close enough to the people. Several studies have shown that these facilities have not been optimally utilised for various reasons such as ignorance, inaccessibility and lack of credibility of services. There is, therefore, an urgent need not only to expand and strengthen the programme infrastructure but also to enlarge its acceptability. The following actions will be taken towards this end :—

(i) The pripheral infrastructure upto the sub-centre level will be completed and made effectively operational by training and re-training of the workers.

(ii) Priority will be given to the training and placement of village health guides, multi-purpose workers and training of all types of birth attendants.

(iii) All primary health centres will be made fully operational by filling all vacancies and through provision of important facilities such as accommodation and transport to workers. The entire expenditure connected with the construction of all building, such as sub-centres and quarters for workers will be an-earmarked budgeted item in the Seventh Plan as State outlays.

(iv) As of March, 1984, 554 post-partum centres (PPC) have been sanctioned in medical colleges, district hospitals and maternity hospitals. Another 400 centres have been sanctioned for sub-divisional hospitals. More sub-divisional level post-partum centres will be established during the Seventh Plan. Provision will be made for financing additional beds, and supporting facilities for such centres which get upgraded.

(v) The scheme of financial support for sterilisation beds reserved for voluntary organisations will be extended to municipal corporations and local bodies

(vi) The scheme of assisting private nursing homes for family planning work will continue

(vii) The scheme of revamping urban family welfare infrastructure will be accelerated to cover the low income segments of urban areas.

(viii) Special infrastructural requirements will be provided for cities with population of 10 lakhs and above to enable them to achieve the goal of 60 per cent couple protection by the year 1990.

(ix) Each major State will have at least one centre of excellence for recanalisaion. For large States, more than one centre can be provided. Persons requiring recanalising will be provided with all facilities such as travel, boarding, lodging etc., at Government expense.

(x) It is proposed to replace about 10 per cent of existing vehicles in the primary health centres every year during the Seventh Plan.

(xi) Since spacing methods will have to receive emphasis in the Seventh Plan, the supply line of oral contraceptives, IUDs and Nirodh has to be kept on stream. This calls for innovative and flexible methods.

11.82 Incentives do play an important role in the promotion of the family welfare programme. During the Seventh Plan, the following suggestions can be activised :—

(i) The present pattern of payment of compensation money to States and individual acceptors is considered cost-effective and satisfactory and will, therefore, continue.

(ii) There is also the need to provide some concrete incentives for programme officers. These need not necessarily be monetary incentives. National awards can be given in recognition of outstanding and meritorious contribution.

(iii) It is recommended that donations to family planning and MCH activities be tax-exempt.

Programme Management

11.83 The efficiency and capabilities of the existing infrastructure can be greatly enhanced through certain managerial and administrative interventions which may be relatively inexpensive. Some of the major deficiencies are non-availability of service personnel in rural areas (due to reluctance, shortage of manpower or for some other reason), relative inadequacy of monitoring and supervisory mechanisms, occurrence of unexpected difficulties and inadequacies in the existing procedural systems to cope with such unforeseen circumstances, etc. With a view to removing such deficiencies, the following measures are proposed to be implemented during the Seventh Plan :

(i) A sizable percentage of admissions to p graduate courses in Government Med Colleges would be reserved for doctors v are borne on the State Health Service a have put in at least three years of serv in rural areas.

(ii) Facility of rent-free accommodation in r areas would be provided and where s facility is not available, house rent all ance would be given in lieu thereof.

(iii) To meet the shortage of trained para-me cals, particularly female multi-purp workers, local women with lower educatio qualifications may be recruited or traini In addition, the sandwich type of cou being followed in the State of Maharash would be adopted.

(iv) All medical students would be given train in vasectomy, minilap tubectomy, MTP IUD insertions so that they are capab contributing to the programme as soon they graduate.

(v) "Reorientation and continuing educati would be a regular part of training act tives. For this purpose, adequacy and e ciency of different types of training cent like those for female multi-purpose worke and of health and family welfare train centres would be assessed. The Cent Training Institutes would develop functio al linkages with such training centres improve their capabilities.

(vi) Managament and Information, Education Communication (IEC) skills of various ca gories of personnel would be suitably graded. For this purpose training needs different personnel would be idenified. Ca bilities of various institutes at the State, gional and Central levels would be asc tained and suitably strengthened. At national level there will be a consortium premier management institutions with tional Institue of Health and Family W fare as a focal point to coordinate, and undertake training activities.

(vii) Allocation of founds for IEC activities be regulated in an appropriate manner not be only confined to agencies like Ministry of Information and Broadc and Directorate of Audo-Visual Pub The strategies and channels would be sified for better and more effectiv tional coverage. States would be allo flexibility for adopting innovative

aches.

(viii) The "Monitoring, Evaluation and Reserach" activities at the Centre and in the States will be suitably strengthened.

(ix) To strengthen "Inter-Sectoral Coordination", all Ministries and Departments, both at the Central and State levels, concerned with socio-economic development programmes would identify concrete areas of tackling population problems and action plans for such departments would be clearly spelled out.

(x) "Demand Generation" activities under the programme will be vigorously implemented during the Seventh Plan.

Research and Technology Development

11.84 Greater emphasis would be placed on "Operational Behavioural Reserach" with a view to popularing the existing family planning methods, increasing their acceptability and removing or reducing the complications or inconveniences associated with various methods of family planning.

11.85 Research related to new methods of family planning which have been found efficatious and safe for their introduction into the national programme would be completed expeditiously, e.g., long-acting injectables and subdermal implants will be introduced progressively in the Seventh Plan. The methods which have been found safe and effective elsewhere and have been approved by the competent authorities abroad may be introduced in the programme on a pilot basis as an operation research scheme and then gradually expanded in the programme.

Policy Thrust Areas for Material and Child Health (MCH) in the Seventh Plan

11.86 The major thrust of MCH in accordance with the National Health Policy in the Seventh Plan would be directed as follows :

(i) Recognising the close relationship that exists between high birth rate and high infant mortality, high priority will be given to the MCH programme.

(ii) Preventive, promotive and educational aspects of MCH services will be given the highest priority.

(iii) A close linkage of health and health-related sectors with MCH activities will be developed.

(iv) Health care for mothers and children will be strengthened through the primary health care approach, which includes integrated, comprehensive MCH care and suitable strengthening of referral services.

(v) Increased emphasis will be laid on people's participation in MCH activities by supporting voluntary organisations, NGOs, village health committees, women's organisations, women's clubs and traditional birth attendants.

11.87 The implementation of the MCH programme would be along the following lines :

(i) MCH services would be provided on the basis of 'high risk' approach.

(ii) Health and family planning services would be assessed and, depending upon the needs, adequate beds would be provided for women and children.

(iii) A sizeable proportion of new beds in the Seventh Plan would be for women and children.

(iv) Logistic, technical, consultative and referral support for primary health care will be provided at the secondary level in community medicine, obstetrics, gynaecology, paediatrics and management.

(v) In order to bring more women and children within the easy reach of MCH services, the primary health infrastructure would be strengthened.

(vi) Efforts would be made to maximise the use of ICDS infrastructure for the enhancement of MCH programmes.

(vii) Special IEC campaigns would be organised to educate women on the advantages of prolonged breast-feeding.

Programme Outline for MCH

11.88 The health of mothers and, in particular maternal mortality, is significantly affected by induced abortions performed by unqualified persons under unhygienic conditions. The Medical Termination of Pregnancy Act (1971), (MTP) is a legislative measure for improving maternal health through the stipulation of conditions under which pregnancies may be terminated. By the end of the Seventh Plan period, it is anticipated that MTP services would be provided at all primary health centres. In urban areas it would be available in all maternity homes and centres. MTP services would be an integral part of maternal and child health services and would be closely linked with the MCH programme. Training programmes would be conducted for improving the delivery of services. An intensive education and publicity programme making use of all available facilities wuld be undertaken for improved services utilisation.

Health Care for Women

11.89 In addition to services provided through the

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general health care system, this programme will aim at raising health consciousness among women. A comprehensive, field-based information, education and communication programme will be developed. Women would be organised around available economic activities to enable them to actively participate in the entire process of socio-economic development including health.

Care of Pregnant and Nursing Mothers

11.90 Pregnant and nursing women are a vulnerable segment of the population. Maternal Mortality rate is estimated to be about Abortion handled by quacks and anaemia are some of the important causes of maternal mortality. Services for the health care of mothers during ante-natal intra-natal and post-natal period will be strengthened. Efforts will be made to cover all mothers by prophylaxis against anaemia. Services of obstetricians and gynaecologists would be provided at community health centres, and at sub-district and district levels.

Care of the New Born

11.91 About half of infant deaths occur during the first month of life and a large number of these occur during the first week of life. Some of the causes of these deaths are low birth weight, inadequate ante-natal and intra-natal care of the mothers, poor care of the newborn soon after birth (resulting in deaths due to asphyxia etc.,) and inadequate referral facilities from primary to secondary and tertiary levels of care. The importance of prevention and promotive aspects of newborn care are well recognised. During the Seventh Plan, neo-natal services will be expanded and extended at appropriate levels.

Care of the Young Child

11.92 The infant mortality rate in India is still very high, and deaths in the pre-school age is respinsible for half the total mortality. The major causes of death are infections (such as respiratory diseases, diarrhoeal disease and others), dehydration and malnutrition. Most of these are preventable.

11.93 Reduction in deaths due to diarrhoea, respiratory infections and malnutrition could be brought about by training multi-purpose workers and traditional birth attendants in the recognition of these problems, administering primary care, as well as in referral of selected patients. Facilities for secondary level care will have to be created. Support facilities and supply of drugs at primary and secondary levels of care will have to be augmented.

11.94 Additional paediatricians will have to be trained to provide the required services for the Seventh Plan period. Facilities for training doctors from primary health centres, as well as para-medical sonnel, in aspects related to delivery of MCH se would be strengthened. Training centres for tra of multi-purpose workers in the delivery of health services will be established.

Expended Programme of Immunisation (EPI)

11.95 A significant part of high morbidity mortality among infants and children can be att ted to a few common communicable diseases can be prevented by immunisation. Under the exp ed programme of immunisation, vaccination ag these diseases is provided. The objectives of immunisation programme during the Seventh Pla be to reduce the incidence of diptheria, who cough tetanus, poliomyelitis, childhood tuberculosi typhoid fever, by making vaccination services ava to all eligible children and women by 1990. E would be directed to achieve self-sufficiency in production of vaccines; their quality control and tribution will also be ensured. Measles immunis will be included in the EPI.

11.96 In order to achieve the objective of un sal immunisation, it will be essential to augmen inputs of trained manpower, 'cold chain' equip transport facilities and other essential supplies equipment. Immunisation services will be pro through all health institutions and health care ca and teams, and the 'cold chain' will be suitably st thened for vaccine storage. The epidemiological tern of diseases will form the basis for progra operations. Surveillance of diseases would be su strengthened to document the impact of services formation dissemination and health education w promoted to raise the health consciousness of p as well as to provide support to health workers.

Health Services for School-Age Children

11.97 The health care programme for schoo children (4—16) will emphasise the detection of rectable disabilities which will prevent major h caps later. The multiplier effect of education children and of child-to-child extension are impo aspects of the comprehensive child health care gramme. Appropriate programmes of health ser for children both in schools and in the comm will be organised.

11.98 There is need to develop a National Ins of Maternal and Child Health to develop and co nate various aspects of MCH.

Indian System of Medicine (ISM) and *Welfare*

11.99 There are over 500,000 practitioners of in India employed in the public sector as well

private practice. Practitioners of the ISM are mostly functioning in far-flung rural areas. They have a long tradition of acceptability among the people. This vast resource would be gainfully used in promoting family welfare, MCH and the expanded programme of immunisation. They can play a very vital role in extension education, supply of contraceptives, etc.

Community Participation

11.100 In the success of the Family Welfare and MCH programme, the most important single factor is the active participation and involvement of the people, non-Governmental organisations and community organisations. The role of Mahila Mandals, Youth Clubs and Village Health Committees is of paramount importance.

Seventh Plan Outlays

11.101 The outlays for the family welfare programme are being stepped up to Rs 3,256 crores. Details are given in Annexure 11.4

CHAPTER 13

SOCIAL WELFARE AND NUTRITION

SOCIAL WELFARE

13.1 Programmes of social welfare as envisaged in the Plans are designed essentially to supplement the larger effort at human resource development. The objective is to improve the quality of life and to cater to the special needs of vulnerable sections like children, women and the handicapped through organised and sustained development activities.

Review

13.2 During the past three decades of planned development, social welfare as a Plan component has acquired great significance, as evidenced by its widening interface with Government and increasing participation by voluntary agencies. Upto the close of the Fourth Plan, most of the programmes were curative or ameliorative in nature. From the Fifth Plan onwards, emphasis has been on the promotion of preventive and developmental services. The Integrated Child Development Services (ICDS) scheme was one of the major programmes taken up in 1975-76 in the Central sector on an experimental basis. It was started in thirty three rural/tribal blocks and some urban slums, for providing children from poor families with the basic services of health, supplementary nutrition and non-formal pre-school education for a better start in life. On the basis of the positive results of these experimental projects, the pace of expansion of this programme was accelerated in the Sixth Plan. The programme has been evaluated through various studies, which revealed that some of the deficiencies noticed in the early stages had been looked into. The coverage of children below 3 years of age, which was found to be low, had started improving and there was an increase in the levels of preventive health care and also greater utilisation of health services. An outstanding achievement in the implementation of the ICDS scheme has been the increase in the convergence of various mutually supportive services.

13.3 Grants continued to be given to voluntary organisations for providing creches for children of working/ailing mothers in the unorganised sector. As per the recommendation of an expert group, constituted in 1981, the scheme "services for children in need of care and protection" was modified and the quantum of assistance to voluntary organisations enhanced. Training programmes for various functionaries connected with the implementation of the scheme were developed and launched in several States/Union Territories.

13.4 Programmes for promoting women's welfare received further fillip. These included socio-economic programmes, which gave employment opportunities to needy women and disabled persons, to supplement their family incomes or to bring about their economic rehabilitation; condensed courses/vocational training courses which prepared women for certain recognised examinations thus enabling them to qualify for specific jobs and acquire various skills; and hostels for women, which helped in providing women from far-flung areas with staying and day-care facilities for their children. However, not all such programmes have progressed satisfactorily. The performance of the scheme "Functional Literacy for Adult Women" (FLAW) which was being implemented in 551 ICDS project areas was evaluated through independent organisations. The average attendance of women in FLAW classes was not found to be satisfactory reportedly sixteen against the envisaged thirty. The scheme on "welfare of destitute women" also did not make much headway.

13.5 Greater attention was paid to the effective implementation of various education, training and rehabilitation programmes for physically handicapped persons. The rates of scholarships to the handicapped were revised upward with effect from 1982-83. A new scheme of "Assistance to disabled persons for purchase/fitting of aids and appliances" was introduced in 1981 on the occasion of the International Year of the Disabled for the economically weak disabled persons. In addition to the special employment exchanges for the handicapped, special cells were set up in the normal employment exchanges to facilitate proper placement of the handicapped.

13.6 The Central Social Welfare Board continued to function as the focal and apex agency in the voluntary sector. It made notable progress in its on-going programmes and initiated new activities during the Plan period. From its traditional role of a funding agency, the Board assumed the role of a catalyst of social change. In this process it assisted about 12,000 voluntary organisations all over the country in the field of welfare of children, women and the handicapped. It made efforts to extend its programmes to the uncovered areas to the extent possible, by encouraging new voluntary organisations. The Board brought out

ory of the social welfare organisations aided The Voluntary Action Bureau, set up in 1982 the challenge of crimes and atrocities against and children, and to create an awakening the masses towards their social responsibility, good progress. Similar bureaux were set up in States|UTs except in Andaman and Nicobar and Goa, Daman and Diu.

7 The Ministry of Social and Women's Welfare nued to give grants to universities|research insti-s|professional bodies for (i) undertaking research s and (ii) oragnising workshops|seminars which help in identifying problem areas and research discuss social problems and disseminate research ngs. The National Institute of Social Defence D) and the National Institute of Public Coopera- and Child Development (NIPCCD) continued ndertake research studies and organise training rses|seminars|worksohps.

3.8 An Information and Mass Education Cell was blished with the aim of creating awareness of ous social welfare schemes, to mobilise public nion against social evils like atrocities against nen, drinking, child marriage, etc., and to promote itive social attitudes. A plan of action was worked and production of films and other software mate- was taken up.

3.9 During the Sixth Plan, several Central pro-mmes had a number of achievements to their cre- These included the sanctioning of additional 869 DS projects bringing the total number of projects to 9; institutional and non-institutional services to 000 children in need of care and protection; 4785 ndensed and vocational training courses benefiting 1,000 women; 3589 socio-economic units covering 011 women and disabled persons; continuation of national institutes for the handicapped, and assist-ce to 58 voluntary organisations for assisting about ,000 disabled persons to acquire aids and appliances, sides providing various training and research pro-mmes. In addition, 7000 creche units covering 75,000 children and 344 working women's hostels th a total capacity of 22,150 inmates were func-ning by the end of 1984-85. In addition to training nctionaries for the ICDS scheme, the NIPCCD ganised 364 workshops and seminars, brought out 5 publications and 60 other documents, and con-cted 40 research studies.

13.10 Social Welfare programmes received further omentum in the State sector as well. Taking advan-ge of the Central ICDS model, some State Govern-ents initiated similar projects. By March, 1985, 117 rojects had been sanctioned. The other programmes nder implementation were creches, balwadis, train-g-cum-production centres for women, institutional and non-institutional services for socially and physically handicapped etc. Children's Acts were enacted in all the States except Nagaland. However, their enforcement is yet to be extended to about one-third of the districts in the country, and services under this legislation were not uniformly available in the covered districts.

13.11 In spite of an outlay of Rs. 272 crore on Social Welfare in the Sixth Plan, there exist wide gaps in coverage and quality. Certain drawbacks have also been observed in the functioning of various schemes. The reach of services in ICDS was affected due to the considerable backlog in training and posting of personnel at various levels, particularly at the anganwadi and supervisory levels. Sustained efforts were made to improve the quality of services being provided in the projects, including health cover and immunisation, training of the anganwadi workers, and technical supervision. Coordination between health and welfare departments continued to improve. Referral services were, however, available only in very few projects. Community participation needed improvement. The quality of training at even a single level of Social Service was not uniform.

13.12 By and large, the concentration of institutional services for children, women and the aged had been in the urban areas, and there were regional imbalances. Institutional services lacked the minimum standard of services, including adequate trained manpower and supervision. Though the grant-in-aid programme had been in existence for a long time, voluntary effort in the North Eastern Region and backward States has yet to develop fully. There was an increasing tendency among voluntary organisations to depend wholly on aid from Government. A proper field counselling system was lacking.

13.13 Monitoring of physical performance is essential for gearing up the programmes to attain the envisaged objectives. Whereas the ICDS programme was systematically monitored such inbuilt arrangements to facilitate corrective action for other programmes were lacking.

13.14 In a few States, the Social Welfare programmes continued to be weak, and lacking in perspective. These need to be reoriented, keeping in view the emerging social problems and changed socio-cultural milieu of the region. In some States, the Social Welfare programmes continue to be administered by more than one department. The administrative machinery at the State level continues to be traditional and, in many States, it is not equipped to formulate proper schemes. Induction of professional competence and establishment of linkages with grassroot level workers were not given adequate attention. State-level organisations need to be reoriented with an interdisciplinary mix of per-

sonnel, taking into consideration programme specifications and objectives. This would make project formulation and implementation more effective, and responsive to local needs. Feedback from States/UTs, particularly on achievement in terms of physical targets under various programmes, continued to be inadequate, resulting in ineffective review.

The strategy for the Seventh Plan

13.15 Social Welfare services in their various facets are preventive, promotive, developmental and rehabilitative in nature. They are designed to enable the targeted sections of society to realise their full potential for growth. The programmes of the Social Welfare sector are only supplementary in nature, designed as they are to meet certain needs of the most deprived and vulnerable members of society.

13.16 The welfare of children, women and the disabled is linked with the development of the family, the basic social unit. Family welfare can best be promoted by providing to its members greater opportunities for employment to augment their incomes substantially; for the most part, these opportunities would be in rural development, agriculture, animal husbandry and other such sectors.

13.17 Preventive and developmental services of a domiciliary nature would be accorded priority over institutional care, as the latter tends to be expensive, and lacks a familial atmosphere which is necessary for healthy growth. Institutional services would be developed wherever necessary and machinery would be geared up to enforce minimum standards of services in the institutions. The existing facilities for institutional care and training of inmates would be reviewed and modified wherever necessary in order to make the programmes more effective. As massive efforts cannot be undertaken in all the fields of social welfare due to financial and organisational constraints, a selective approach has to be adopted for undertaking various programmes with a view to maximising the benefits to a larger number and minimising administrative costs. Spreading resources thin over a large number of schemes would be avoided, in order to make an impact on the intended target groups.

13.18 Child welfare would be given the highest priority. The basic minimum child care services would be extended to the most vulnerable group, i.e. 0—6 years of age, specially the age-group 0—3 years, in order to reduce the high incidence of child mortality, morbidity and malnutrition in the country. More emphasis would be laid on enhancing the capabilities of the mother to look after the health and nutritional needs of the children. Effective coordination would be sought in the provision of health inputs, nutrition education, water supply and other relevant services in order to maximise the returns from investments. Schemes for the welfare of women and also the handicapped will be given greater attention.

13.19 The emerging nuclear family is exposed to severe economic and social strains, as the traditional mechanism of social security and adjustment in times of crisis and conflict has almost been eroded. Here the stress would be on further strengthening the supportive services to the family.

13.20 In programmes for women, greater stress would be laid on the generation of both skilled and unskilled employment and promotion of opportunities for higher level skills through proper education and vocational training. Areas for the introduction of new technologies for reducing drudgery of household work would be explored; studies would be taken up in this area. The lacunae in legislation which hinder the availing of benefits and which also discriminate against women as compared to men would be reviewed in order to make the laws more equitable and practical.

13.21 Education and training play a vital role in the socio-economic rehabilitation of the physically handicapped. They would be encouraged to pursue education and vocational training thorugh scholarships and other promotional aids in order to draw them closer to the normal stream of life. Prevention of disabilities through early detection and treatment of the physically handicapped would be given relatively high priority compared to purely curative services. Training institutions will be strengthened and expanded in order to make them perform the roles expected of them at the national level. Special attention would be given to the development of multi-disciplinary services, both in identification and treatment of the handicapped. Facilities for fitting of aids and appliances, particularly in the remote and backward areas, would be expanded in order to enable the beneficiaries to participate in economic and cultural activities to the fullest possible extent.

13.22 The Central Social Welfare Board and its counterparts in the States would be required to shoulder more responsibility in promoting, strengthening and stimulating voluntary effort in different sub-sectors of social welfare and specifically in the areas of children's and women's welfare. The existing arrangements for coordination between the State Boards and State Departments of Social Welfare would be reviewed in order to avoid any duplication of effort. Voluntary agencies will be aided to take up activities in the backward, tribal and rural areas, rather than concentrating their efforts in the urban and metropolitan centres. Besides the programme support, grants-in-aid would be given for strengthening their administrative capabilities and expanding their programme coverage particularly in respect of children, women and the handicapped. The existing procedure for the release of grants would be reviewed

a view to make the grant-in-aid programme e simple and responsive to the needs of the volun- ager ies.

3.23 During the previous Plans, welfare serivces e expanded considerably, particularly in the s of child and women's welfare. Besides, a ety of programmes for the economically weaker ions have been introduced by different Ministries he Centre and also by the State Governments. The inistrative machinery for project identificaion, mulation and implementation, particularly at the e level, would need to be strengthened, taking into count the programme content and coverage. Pro- sionally trained technical manpower would have to inducted at decision-making and supervisory levels. nctionaries engaged at different levels in the on- ing schemes would have to be suitably trained to ake them acquire the basic skills required for pro- amme management.

1 .4 Social welfare programmes by their very re will not succeed unless the local communities d beneficiaries participate fully and extend their operation in all stages of implementation. They ould have to be involved in identification of local eeds and prospective beneficiaries, delivery of ervices and programme supervision. Welfare Advi- ory Committees at different levels with representa- ives from local bodies and other community agencies ould have to be constituted to deliver benefits to he intended target groups.

Seventh Plan Programmes

13.25 *Child welfare*: The major programme of ICDS seeks to lay a solid foundation for the develop- ment of the nation's human resource by providing an integrated package of early childhood services. These consist of (i) supplementary nutrition, (ii) immunisation, (iii) health check-up, (iv) referral services, (v) nutrition and health education and (vi) non-formal education to children below 6 years of age and pregnant and nursing mothers in most backward rural or tribal blocks and urban slums. While the programme would be expanded, emphasis will be on consolidation and improving the quality of services. The health component of the programme, viz., immunisation, health check-up, Vitamin 'A' pro- phylaxis, and iron and folic acid distribution, would be strengthened with stress on uninterrupted delivery of services. Necessary action would be initiated for maintaining the "cold chain" for the proper storage of vaccines. Efforts would be made to see that these services specially reach children below 3 years of age. Greater stress would be laid on the training of functionaries, as well as on their continued education through periodical refresher training courses. The mechanism for effective coordination between wel- fare and health departments at the block levels would be strengthened. Community support and participa- tion would be elicited in running the programme. Further streamlining of the monitoring mechanism is envisaged for timely modification and corrections in the programme, wherever necessary. Voluntary agencies and individual talent will be utilised in programme supervision, review and monitoring. They will be given financial and organisational support for this purpose.

13.26 The schemes for (i) services for children in need of care and protection and (ii) creches for the children of working/ailing mothers would be mode- rately expanded. It is proposed to ensure a minimum standard of services in the children's homes and creches through properly trained staff and adequate supervision. The training programme in the children's homes would be diversified and further vocationalised in order to provide larger employment opportunities to children once they have some degree of maturity. Setting up of separate institutions for these purposes would thereby be avoided. The services of institutions like ITIs and other training-cum-production centres, etc., would be availed of.

13.27 *Women's welfare* : The welfare programmes for women aim at providing those essential services for women which are not available to them under the general development programmes. The highest priority will be given to programmes extending oppor- tunities to women for gainful employment. A new scheme, namely, Women's Development Corpora- tions, would be taken up, through equity participation on a 50 : 50 basis between the State and the Centre, for promoting employment-generating activities for women's groups and women from the weaker sections. The main functions of the Corporations would include identification of potential areas of employment, assistance to beneficiaries in project formulation, raising the requisite finances, arranging raw materials, providing consultancy services, creating an infrastruc- ture for the marketing of products and other services which would promote economic development for women through gainful activity. The 'Socio-Economic Programme', which aims at providing opportunity for 'work and wages' to needy women and disabled persons by setting up small units, e.g., ancillaries to large industries, handloom/handicrafts units, agro- based units, etc. would be continued and steps would be taken to make the schemes bankable in order to

attract more institutional finance and for a large coverage of beneficiaries under employment. The scheme of 'Condensed Courses of Education and Vocational Training for Adult Women', would be expanded to prepare the target group for public examinations upto matriculation/higher secondary level, and would impart training in vocations with a high employment potential. Measures would be taken to enhance the competence of the teaching staff/ training institutions. Assistance for construction of 'Hostels for Working Women' to provide safe, suitable and healthy accommodation to women who migrate to urban areas for employment would be extended to more areas. Training courses of short duration would be organised for rehabilitation of destitute women in various vocations and trades of non-traditional nature. The implementing agencies would ensure their rehabilitation after the completion of training. Rural women would be encouraged to form themselves into a group/society to take up welfare activities in those areas where no such organisations exist, and bring about an awareness of social responsibility among the women of the region.

13.28 The Central Social Welfare Board, which is a Central organisation responsible for promoting and strengthening of voluntary effort, would pay attention to motivating more organisations to underake welfare programmes for children, women and the handicapped. It would make efforts to identify voluntary organisations all over the country, and provide them with the required organisational and financial assistance. Necessary training for voluntary workers would be imparted at appropriate institutions. Field counselling services would be developed for offering technical assistance and guidance in order to improve the working efficiency of the voluntary organisations.

13.29 *Welfare of the handicapped* : The main thrust in the programme for welfare of the handicapped will be on prevention of disabilities and development of functional skills among the handicapped. A large number of disabilities are preventable, if timely measures are taken in the areas of health and nutrition and accident prevention. Besides strengthening the activities of immunisation/prophylaxis against diphtheria, whooping cough and tetanus, nutritional anaemia and blindness due to Vitamin 'A' deficiency and vaccination against polio and typhoid and the provision of nutritional supplements, education in health and nutrition will be given priority. Suitable measures to prevent and control disabilities caused by accidents will be taken. A programme of mass education for early identification of disabilities and the symptoms causing them will be intensified.

13.30 Simple, durable and inexpensive a appliances would be made available to hand persons so that they can become function useful citizens. The National Institute for Reh tion, Training and Research (NIRTR), earlier as National Institute of Prosthetic and O Training (NIPOT), will continue to conduct courses for prosthetic and orthotic technicians, rehabilitation assistants, doctors and professionals. When awarding scholarships to capped persons, stress would be laid on voc training, which has better employment po Training schemes would be so devised as to adequate vocational skills leading to employm the open market or to self-employment. She workshops for the severely handicapped will s supplement those efforts. Suitable arrangemen envisaged for organising supply of raw material for marketing their products. Employment o specialising in placement of handicapped perso proposed to be added in all employment exch with registration of 150 or more handicapped pe Incentives would continue to encourage dis workers to improve their standard of performan persuade employers to accept physically handica persons. The scheme of District Rehabilitation Ce (DRC), which aims at providing comprehensive integrated care services to the handicapped indivi from early childhood till he is rehabilitated in community, is being taken up at present on a basis. Further expansion would be taken up after programme is evaluated. Grants-in-aid will conti to be given to voluntary organisations for purch of equipment and improvement of standards services for the handicapped.

13.31 The activities of the four national institu for the handicapped, i.e, one each for the visua handicapped, orthopaedically handicapped, hear handicapped and mentally handicapped, working the field of training, research, vocational guida and development of suitable service models for disabled, would be strengthened, based on the lat research and developments taking place, both insi and outside the country. These institutes wou continuously evaluate the existing technology a explore new methodologies for promoting the op mum utilisation of the capabilities of the handicappe so that their occupational options are widened, wi resultant improvement in their social independenc

13.32 *Social defence* : In order to raise the quali of social defence services on the basis of certai well-defined norms and to keep abreast of newl emerging forms and trends of criminality a compre hensive approach towards preventive treatment an

lative services is envisaged. Greater stress be laid on the creation of public awareness ing social legislation enacted to safeguard the and interest of children, women and other ries of socially handicapped persons. Efforts be made to provide services under the en's Act in a judicious manner to all the areas country. Keeping in view the growing menace venile maladjustment and delinquency, a new me, viz., Prevention and Control of Juvenile djustment with optimum use of community based ces will be taken up through the States and on Territories as a Central Scheme on a pilot in few selected urban areas. This would include ariety of programmes such as counselling and dance, family life education, organised recreation, Similarly another scheme, 'Welfare of Prisoners', ld be taken up to strengthen the correctional tent of prison programme through the provision educational and vocational training, after-care vices and training of personnel. These two new emes are aimed at evolving appropriate models the prevention and treatment of delinquency and me in keeping with the realities of the socio-ltural and economic life of the people. Besides, an ded thrust would be given to the protection of omen in moral and social danger, and the scheme Short Stay Homes would be expanded moderately cover all helpless victims.

13.33 In dealing with the various social defence rogrammes National Institute of Social Defence NISD) will lay stress on the areas of research and valuation, training of functionaries and consultancy or official and non-official implementing agencies.

13.34 *Prohibition* : Recent studies indicate that he consumption of narcotics, alcoholic drinks and ddictive drugs which are deleterious to physical and mental health is on the increase, particularly among he younger age-groups. The intemperate use of these addictives has brought in its wake a variety of undesirable consequences, and even economic ruin to many poor families. These would have to be discouraged with sustained propaganda and community education through the mass media, particularly television and films. Local bodies, voluntary agencies and communities would be encouraged to undertake educational work on a wider scale for the promotion of temperance and avoidance of consumption of alcoholic beverages. Intensive efforts would be initiated for preventing the brewing and drinking of illicit liquor by the vulnerable sections of the population.

13.35 *Mass education* : Social problems are closely associated with traditional attitudes, beliefs and ignorance prevailing among the people. Some of these have worked as major constraints on proper implementation of different development and welfare schemes. The Information and Mass Education Cell functioning at the national level would continue to accelerate its efforts for creating community awareness and public opinion against social evils. It would identify the relevant material and prepare inputs for various media like television and radio in addition to undertaking printed publicity work. It would maintain a regular liaison with the media units.

13.36 *Social welfare in the State Sector* : In the State sector, the social welfare programmes are variegated, depending upon the nature and magnitude of the prevailing social problems in the different regions. In all these programmes, utmost importance would be given to education, training and rehabilitation services so as to enable the concerned target group to become self-reliant. Institutional care will be provided only where it is necessary. Child welfare will continue to receive high priority. The States and Union Territories would be encouraged to undertake additional ICDS projects on the Central pattern to cover more children, pregnant women and nursing mothers with a package of nutrition and health services. Efforts would be continued to provide creches|day care services for children of working women, with increased emphasis on improvement in health and nutrition linkages. In income-generating activities such as craft training, training-cum-production centres etc., meant for needy women and handicapped persons, stress would be laid on diversification and introduction of new trades|vocations keeping in view the availability of local raw material and market needs. The Women's Finance and Development Corporations in certain States have proved very useful in helping women to take up bankable projects, and thereby raising their income status. The feasibility of similar programmes in other States|UTs would be explored.

13.37 The schemes of orthotic and prosthetic aids to physically handicapped persons would be expanded further with adequate facilities of fitting centres. Educational incentives like scholarships|stipends, book grants, uniforms etc., are envisaged to improve the enrolment ratio of physically handicapped children at the primary and middle levels. This would help them to avail of higher level educational facilities and related job opportunities.

13.38 The services envisaged under various legislations such as juvenile courts, children's homes, remand|observation homes, certified schools, rescue homes, beggar homes etc. would require to be strengthened, keeping in view the increasing problems

f juvenile delinquency, trafficking in women and irls and beggary in the country. The States and UTs vould be requested to adopt the progressive features f the Central Children's Act. Financial assistance vould continue to be provided to voluntary organisa-ons for undertaking institutional and non-institu-onal services for the affected groups. It would be mpressed upon the States and UTs that they should evelop suitable technical competence at different evels, so as to identify and assess the emerging social roblems in particular areas, and suggest and devise ays to overcome such problems.

13.39 *Research* : For ensuring better results from ne programmes under implementation, research and valuation studies would be sponsored|taken up, and atistical data collected in the priority areas, keeping view the Plan policies and social problems. Pro-lems related to child development would be studied the context of the social-cultural milieu of the gions, and required changes or modifications brought bout in the child welfare services. Studies would be ken up to identify problems in the area of child bour, particularly in the unorganised sector, and lso those engaged in hazardous occupations. Prob-ms of displacement of women due to the introduction f new technologies in identifiable areas, and causes r the decline of employment of women in certain ctors would have to be investigated. The problems mortality and morbidity among female babies and e impact of malnutrition among pregnant women nd on the health of the babies and mothers also eed to be analysed. The needs of continuing educa-on with a view to promoting formation of skills and nployment would have to be studied and areas of ocationalisation suitable specifically for women entified. The gaps and the needs under various aining and rehabilitation programmes for the handi-pped would need to be assessed by initiating micro-vel studies. The grants-in-aid programme would be viewed for further simplification and avoidance of lays in the sanctioning and disbursement of sistance.

13.40 Research studies relating to the spread of e usage of drugs and alcholic drinks among students, dustrial workers and other vulnerable sections will supported on a wider scale. The efficacy of the ildren's Acts in terms of level of services provided vid be studied. Various pieces of social legisla-n concerning dowery, prohibition, equal renumera-n, excise policy in tribal areas etc. have been in ce for quite some time. The impact of such gislation on the intended target groups and the ade-acy|inadequacy of various provisions thereunder in light of experience would be analysed.

13.41 The role of people's participation and their awareness of such legislation would also have to be assessed in order to make social legislation more effective. Most of the State Govts. have enacted legis-lation for the prevention of beggary and have taken up a number of schemes for training and rehabilita-tion of beggars. The cost effectiveness of these prog-rammes and their successful implementation would also have to be studied in order to formulate the training and the rehabilitation programmes based on the needs of the inmates in the beggar homes.

13.42 The linkages and mechanism for effective application of science and technology would be esta-blished with a view to tackle the problems of phy-sical disabilities, drudgery in women's work, preser-vation of polio vaccines etc. Studies would be taken up on the development of modification|selection of aids and appliances for disabled persons, household equipment and gadgets for women, portable containers for storage of vaccine and other similar aspects.

13.43 *Administration and monitoring* : The Admi-nistrative machinery, both at the Central and State levels, will be strengthened. In the States, emphasis would be on bringing the administration of social welfare programmes under one department wherever this arrangement does not exist. Alternatively, an attempt would be made to take steps for effective coordination to achieve a unified approach and direc-tion in planning and implementation. Induction of professional staff and expansion of in-service-training, will be given due attention for improving the tech-nical skills needed for project identification, formula-tion, implementation and monitoring.

13.44 Monitoring of various Plan programmes would be given more importance, as this is a pre-requisite for taking up any modifications|corrections in the schemes. This aspect would also be given attention at the district and other lower levels. Pro-vision has also been made for setting up a 'Women's Development, Planning and Monitoring Cell' at the national level to monitor the Central and State prog-rammes being implemented under various sectors for women's development.

Outlays

13.45 The outlay for Central and Centrally spon-sored schemes in the Social Welfare sector is Rs. 799.97 crores vide details in Annexure 13.1 The Plan outlay for the States and Union Territories is Rs. 191.87 crores and Rs. 20.52 crores respectively, vide details in Annexure 13.2.

NUTRITION

13.46 The problem of under-nutrition and mal-nutrition widely afflict certain sections of the popu-

Protein-energy Malnutrition (PEM) has been dentified as the major nutritional problem in Various studies on dietary intakes reveal that utritional gap in children is primarily due to quate nutritious food and not the protein Pregnant women and nursing mothers and n belonging to the younger age-groups have eserves of Vitamin 'A' which leads to xerop-a. Infants with low birth weight generally have stores of Vitamin 'A'. Severe forms of PEM caused two clinical forms of disorders, i.e., iorkor and Marasmus among the children ing to the poorer families. Iron deficiency ia among women of all age-groups, and parti-y those in the reproductive age-group, is also or problem. Besides, goitre which is widespread g the hill regions of the country due to iodine ency, is also being noticed in other parts of the ry. Populations inhabiting certain ecological are affected by fluorosis, caused by water with h fluoride excessive content, while lathyrism is ed among people who consume kesari dal.

.47 The prevailing high mortality rates among fs and toddlers, and also the morbidity patterns, a link with malnutrition and intestinal infection. s been well established that the main causes that vate the prevailing mortality and morbidity rates nder mal-nutrition, lack of health facilities, ab- of safe drinking water, environmental hygiene bad sanitation. Besides, socio-economic imba-s, unemployment and inadequate purchasing r and inability to utilise health services and infrastructure aggravate this problem.

.48 The worst victims of this problem are child-n the age-group 0—6 years, pregnant women and ng mothers, and particularly those belonging to e population groups in drought-prone areas and te tribal areas and among landless agricultural urers, rural artisans and certain strata living in n slums. Dietary surveys by the National Nutri- Monitoring Bureau reveal that nearly 50 per cent he households surveyed in different States of the try consume food which is quite inadequate to t their requirements of either calories or proteins, ven both. An assessment of malnutrition among dren below 6 years of age reveals that less than 15 cent of them could be considered as having a nal status of nutrition; the rest suffer from varying ees of under-nutrition.

3.49 The nutritional deficiency disorders are close-ssociated with poverty, unemployment, illiteracy, of environmental sanitation and hygiene, large ily size, birth order, non-observance of spacing bet-n children and lack of safe drinking water.

13.50 The problem of malnutrition has been recognised since the inception of the Plans, and a number of schemes were introduced for combating it. However, during the first three Plans nutrition was not singled out as such for specific Plan programmes but formed one of the components of the health sector. It was only in the Fourth Plan that an Integrated Nutrition Programme was introduced. It was recognised that production of more food was needed to solve the problems of malnutrition and to improve the nutritional status of the population. Thus, stress was laid on agriculture and its allied activities as an effort in this direction. The applied Nutrition Programme which was introduced in 1960 was extended to all the States and Union Territories by 1973. It aimed at spreading the concept of balanced diets, production and consumption of protective foods and proper techniques of cooking. The Mid-Day Meal Programme (MDM) for providing supplementary food to school children, which was introduced in 1962-63, became a part of the Minimum Needs Programme in the Fifth Plan under the State sector.

13.51 The Special Nutrition Programme (SNP) for pre-school children and pregnant women and nursing mothers was introduced in 1970-71. It was originally launched as a Central Programme and was transferred to the State sector in the Fifth Five Year Plan as a part of the Minimum Needs Programme. The integrated Child Development Services (ICDS) Programme was started in 1975-76. The Special Nutrition Programme is in operation since then in the Integrated Child Development Services Projects, although there are feeding centres outside the project areas also.

Sixth Plan Review

13.52 The anticipated coverage under SNP by the end of the Sixth Plan was 11 million beneficiaries, including a coverage of 5 million beneficiaries outside the ICDS. Under the Mid-Day Meal Programme (MDM), the coverage increased to 20 million beneficiaries by the end of the Sixth Plan.

13.53 Among the Central sector programmes, the thirty-one Mobile Extension Units (MEU) continued to work for popularising local low cost foods, promoting suitable dietary habits and propagating nutrition education. These units conducted 86,000 demonstrations, covering approximately 30.20 lakh beneficiaries during the Sixth Plan. Besides, a number of folders, pamphlets, booklets, and wall posters of various types were published for country-wide distribution under the scheme of "Mass-media Communication Extension" for disseminating information and creating awareness on food preservation and nutrition among the masses.

13.54 There were two plants working at Bangalore and Hyderabad for the production of Miltone at the beginning of the Sixth Plan. Three plants were added during the Sixth Plan period at Ranchi, Calcutta and Kanpur. By the end of the Plan period, five plants were producing around 30,000 litres of Miltone a day, against the installed capacity of 38,000 litres/day.

13.55 Three energy food plants at Belgaum, Chitradurga and Raichur and five Ready-To-Eat (RTE) extruded food plants at Hyderabad, Delhi, Dhar, Jaipur and Gangtok were set up during the Sixth Plan period. These had an average production capacity of 69 metric tonnes per day. The food produced was used in the supplementary feeding programme for pre-school and school children in the supplementary nutrition programme.

13.56 Fortification of milk with Vitamin 'A' to curb nutritional blindness, was started at the Mother Dairy at Delhi in 1980. Fortification was also started at two other dairies, viz., the Delhi Milk Scheme, Delhi and the Mother Dairy, Calcutta. The total quantity of milk fortified by these three dairies was about 11.2 lakh litres per day by the end of the Sixth Plan period.

13.57 For combating the problem of anaemia due to iron deficiency, the effects of consuming iron fortified salt were field-tested. Taking the results of the trials into consideration, a project for the commercial production of iron fortified salt in collaboration with the Government of Tamil Nadu is being contemplated. A capacity of 15,000 metric tonnes per annum is projected.

13.58 Diet and nutrition surveys were carried out in the States and Union Territories of West Bengal, Meghalaya, Pondicherry, Kerala, Bihar, Tripura, Sikkim, Andaman and Nicobar Islands and Goa, Daman and Diu, to collect information on food consumption, dietary patterns, attitudes and beliefs about various foods consumed. On the basis of the data obtained, the Government of India suggested low-cost balanced diets for different age-groups and areas.

13.59 The two supplementary feeding programmes have been evaluated, and several studies conducted, in different parts of the country to determine their cost effectiveness and impact on the beneficiaries. Only a few studies with small sample sizes have confirmed improvement in areas where the programmes have been executed effectively. Various drawbacks that have been pointed out include improper selection of beneficiaries; lack of continuity in food supplies; poor community support; sharing of food by non-beneficiary members of the family; pilferage in the channels of distribution; non-adherence to the minimum number of feeding days; and lack of proper infrastructure for supervision, implementation and monitoring at the field level.

13.60 The feeding programmes were taken up without proper integration with programmes of employment, health, drinking water, hygiene and sanitation. In the absence of such linkages, not much impact on the improvement of the nutritional and health status of the community was observed.

13.61 The evaluation of the extension programmes through MEUs reveals that the visit frequencies of these units in rural areas were very low and their activities were mostly concentrated in the cities. The MEUs could visit a village not more than once a year; the staff members were mostly urban oriented both in education and temperament, and as a result, it was difficult for them to establish rapport with rural communities.

The Objectives of the Nutrition Policy

13.62 The long-term nutrition policy has to aim at increasing the functional efficiency of the labour force and other segments of the population by promoting the concept of balanced intake of nutrition with locally available food commodities. The policy would have to be focussed so as to improve the nutritional status of a child during the pre-school years, as this would determine to a considerable extent the work-capacity and endurance during adult life. The nutrition policy should also achieve reduction in infant and maternal mortality rates and bring about changes for the better in the prevailing patterns of morbidity. Besides, considerable importance should be given to the reduction of nutritional deficiencies among the vulnerable sections of the population, particularly children and nursing mothers.

Strategy for the Seventh Plan and beyond

13.63 *Long term strategy* : Foremost among the elements of the long-term strategy to combat malnutrition and under-nourishment is the expansion of employment opportunities and stabilisation of income, especially among the vulnerable population groups. Besides the main income earning activity, subsidiary occupation to augment family income would have to be encouraged thorugh imparting suitable skills, which would promote diversified subsidiary occupation and income generating assets under the various anti-poverty programmes. Simultaneously, effort would have to be made for an extended public distribution system, which would cover ultimately the entire country, but in the medium term it would be extended to provide the essentials of a balanced diet at reasonable price in the endemic poverty stricken, malnourished/undernourished parts of the country. The agricultural policy would have to include pointed support for such an extended public distribution network so that cereals, legumes and pulses and edible oils in sufficient quantities are made available. Post-harvest technologies,

st transportation and effective delivery systems have to be devised. Besides processing with technologies to the extent feasible, local popu- and communities would be fully involved in the ation and distribution of food and other com- s required for a balanced diet. A massive nut- ducation programme, as part of the total pack- health and nutrition services has to be mounted h the mass media for generating awareness and dge among rural families and especially women, importance of nutritional requirements for a y life.

.64 Efforts would have to be made to further id the programme of immunisation of children pregnant women. Children in the age-group 0-3 would require total immunisation in order to and the commonly prevalent diseases.

.65 Lessons on nutrition, health, welfare and lation control will have to be given to the tar- eneficiaries through formal and non-formal chan- For this, the educational content would need to on the relationships between health, nutrition, rate, immunisation and environmental and other sitic infestation. Functionaries at various levels Auxiliary Nurse Mid-wives, Gram Sevikas, Angan- workers, teachers and personnel engaged in ntary welfare work would have to be trained to er the message of the relevance and importance utrition and health education through suitable in- ice training programmes.

9.66 It is well recognised that lack of protected r supply in rural and urban areas causes diarrhoea, ro-enteritis, dysentery and hepatitis. These disea- account for a large proportion of infant and child tality. The provision of safe drinking water, along drainage facilities, would have to be given grea- attention for effecting improvements in community lth. Incentives would have to be given to communi- , local bodies and families in order to promote ption of low-cost sanitation methods like those ch have been adopted with success in many parts the country. This would remove one of the most quent causes of infection and disease in rural as l as many urban areas. Besides, adulteration of dstuffs would have to be checked effectively in er to minimise the deleterious effect on the health the population.

13.67 Universities, research organisations and other untary agencies would be assisted and stimulated assuming larger roles in the formulation and eva- tion of various schemes.

13.68 Youth clubs, Mahila Mandals and voluntary ganisations would have to play an important role stimulating voluntary effort and in ensuring that vices reach the intended target groups.

13.69 Thus, for improving the overall nutritional status on the long-term basis, a coordinated effort would have to be made in the areas of (i) employment generation; (ii) equitable distribution through expansion of public distribution system; (iii) provision of safe drinking water supply; (iv) immunisation on a wider scale; (v) expansion of health care system; (vi) creation of awareness about personal hygiene; and (vii) control of communicable diseases and intestinal infestations.

13.70 *Immediate measures* : However, as a short-term strategy, special attention would need to be given to the vulnerable sections like children, pregnant women and nursing mothers, under the direct nutrition intervention schemes like Supplementary Nutrition Programme (SNP) and Mid-Day Meals Programme (MDM). These programmes would have to be continued with a selective approach to benefit children and mothers living in the most backward rural and/or tribal area and in drought-prone areas and urban slums. Efforts would be made to restructure the on-going programmes by adding related inputs so as to make them more effective. Supplementary Nutrition Programme would be confined to the ICDS scheme|blocks to the maximum extent possible. Wherever it is operating outside the ICDS, provisions would be made for bringing in other inputs, particularly health. The nutrition components of Primary Health Care need to be identified and incorporated in service delivery systems. Maternal care is crucial for child health. Wholesome child-feeding and weaning practices hold the clue to child health and these need to be inculcated through education. All educational programmes must support breast-feeding. The energy drain on women fetching water and fuel over long distances has to be alleviated by ensuring easy access to these essentials. Improvement of nutritional status of vulnerable sections continues to present a challenge; an effective response is needed.

Seventh Plan Programme

13.71 *The Special Nutrition Programme* will continue to be the major intervention feeding programme attempting to provide 300 calories and 8-12 grams of protein per beneficiary in the age group 0-6 years, and 500 calories and 25 grams of protein for pregnant women and nursing mothers for 300 days in a year. Besides continuance of nutrition support to 11 million beneficiaries in the 1136 on-going ICDS projects, i.e., 1019 projects in the Central sector and 117 projects in the State sector, and SNP centres outside ICDS areas, the programme would be expanded to cover all the additional ICDS projects during the Seventh Plan. Measures would be taken up to bring SNP centres either within the ambit of the ICDS programme or upgrading them by linking them with other

inputs like health, sanitation, hygiene, water supply and education. Attempts would be made to ensure uninterrupted supply of required nutrition material for specified days in all the anganwadis/SNP centres. The unit costs would be revised to ensure required nutrients etc. to the beneficiaries.

13.72 *The Programme of Mid-Day Meals (MDM)* for school going children in the age group 6—11 years, provides 300 calories and 8—12 gramms of protein per child per day for 200 days in a year. About 20 million beneficiaries were getting such nutrition support at the end of the Sixth Plan. The scheme did not contribute adequately to the improvement of the nutritional status of the child. Hence, stress would be laid on the consolidation of the programme by linking it with other inputs of health, potable water, improvement in sanitation etc. rather than on its quantitative expansion.

13.73 *Education and extension* : The programme of Nutrition Education would be a long-term measure in dealing with the problem of malnutrition and its causative effects. An integrated scheme for imparting education on nutrition and other related aspects like health, environmental and personal hygiene, child welfare, etc., would be taken up through the mass media and inter-personal communication, so as to extend coverage in terms of both beneficiaries and content. Relevant audio-visual messages would be developed as a communication unit. It is also proposed to train field level staff especially functionaries such as ANMs, CHVs, AWWs, VLWs, village teachers and Mahila Mandal workers in coordination with training organisations working in this area. Besides, for disseminating knowledge and creating awareness on food preservation and processing, updated resource material in the form of booklets, pamphlets and newsletters and audio-visual aids such as slides, photographs and posters would be brought out on a bigger scale.

13.74 *Production and processing schemes* : Miltone a beverage based on a blend of milk and vegetable protein, is at present being processed in five plants with an installed capacity of 38,000 litres/day. Besides, five plants manufacturing Ready-To-Eat (RTE) and three energy food plants are in operation, each with a production capacity of two or more tonnes per day. It is proposed to set up three additional miltone plants, each with an installed capacity of 10,000 litres a day and three additional RTE food plants, each with one-tonne-a-day capacity. These plants would be working in close collaboration with the feeding programme.

13.75 *Fortified food* : At present 12.5 lakh litres of milk per day are being fortified with Vitamin 'A'. It is proposed to expand production to achieve a target fortification of 45 lakhs litres/day by the end of the Seventh Plan.

13.76 With the development of process technology for fortification of salt with iron, it is now considered feasible to combat the widespread problem of iron deficiency anaemia. The project for the fortification of salt with iron already initiated in the Sixth Plan would be further expanded by commissioning three new plants with a total production capacity of 45,000 metric tonnes of iron-fortified salt every year.

13.77 *Survey, research and evaluation* : The scheme of Diet and Nutrition Surveys would be continued to find out the nutritional status of the population, including the incidence of deficiency diseases. Stress would be placed on the utilisation of the research findings by various governmental agencies and the improvement of the quality of data collection.

13.78 Research and development activities are of utmost importance in the area of low cost nutritious foods using locally available materials. Work on special types of diets and processed foods would be initiated with the help of the Central Food Training and Research Institute (CFTRI), National Institute of Nutrition (NIN) and similar institutions. Universities and research organisations would be encouraged to undertake investigations with a common research design, on the dietary habits of different people and identification of subtle socio-cultural and customary beliefs and practices affecting their nutritional status. Impact of on-going nutrition and education programmes by different media and ICDS scheme on the reduction of mortality, morbidity rates and incidence of malnutrition would need to be assessed and necessary changes/modifications brought about in the respective programmes. It would be necessary to undertake researches to develop reliable and simple indicators/instruments for identification and measurement of nutrition deficiencies for field application.

Outlays

13.79 An outlay of Rs. 7.32 crores is provided for nutrition programmes under the Central sector vide details in Annexure 13.3 The Plan outlay for the States is Rs. 1693.86 crores while that for the Union Territories is Rs. 39.00 crores, vide Annexure 13.4.

ANNEXURE 13.1

Seventh Plan Outlays—Social Welfare, Central and Centrally Sponsored Schemes

(Rs. crores)

	Plan outlay	
	Sixth Plan 1980–85	Seventh Plan 1985–90
and Development of Children		
s/day-care centres for children of working/ailing mothers	9.75	50.00
to National Dairy Development Board for development programmes	$	2.50
tional Year of the Child	0.01	—
work education and training :		
ining of non-ICDS functionaries	7.00	2.00
aining of ICDS functionaries		20.00
al Institute for Public Cooperation and Child Development	1.50	1.00
and Development of Women		
onal literacy for adult women	2.37	—
s for working women	13.75	30.00
up of employment and income-generating training-cum-production centres for women	@	2.00
ndense courses for primary levels	7.00	25.00
ondensed courses for middle/high school levels		
ocational training courses	9.25	19.50
-economic programmes	1.97	0.97
ng of rural women in public cooperation	—	16.00
en's development corporations	—	0.50
ens development, planning and monitoring cell	—	45.00
ort to training-cum-employment programme for women	16.75	20.00
s-in-aid to voluntary organisations through Central Social Welfare Board		
re of handicapped		
sion and improvement of National Institutes for the visually handicapped, the ortho-	6.80	100
cally handicapped, the hearing handicapped and the mentally handicapped	2.00*	2.00
nal Institute for Rehabilitation, Training and Research	17.78	20.00
larships research, training, sheltered employment and grants to voluntary organisations	@	1.00
ict Rehabilitation Centres		
l Defence	£	1.00
t-stay homes	0.75	1.00
ation work for prohibition and prevention of atrocities on women	0.25	1.00
onal Institute of Social Defence		
rs	1.00	1.00
EM and Innovative action-cum-research projects	2.75	1.00
nts-in-aid to All India Voluntary Organisations	@	0.50
rmation and Mass Education Cell in the Ministry of Social and Women's Welfare		
TOTAL : Centre	95.68	272.97
LLY SPONSORED		
Care and Development of Children	5.75	20.00
ices for children in need of care and protection	45.00	500.00
grated Child Development Services		
Care and Development of Women		
stance for setting up women's training centres/institutes for rehabilitation of women in	0.75	1.00
ress (welfare of destitute women and children)		
elfare of handicapped	2.80	—
grated education	0.02	1.00
ement of handicapped through special employment exchanges/special cells in employment exchanges		
ial Defence	—	2.50
vention and control of juvenile maladjustment	—	2.50
lfare of prisoners		
TOTAL : Centrally Sponsored	54.32	527.00
AND TOTAL : Centre & Centrally Sponsored	150.00	799.97

Provision made under Rural Development sector.

Provision was made on year to year basis.

Originally the outlay was for Artificial Limbs Manufacturing Corporation/National Institute for Prosthetic and Orthotic Training.

Included under Item V-2

CHAPTER 17

SCIENCE AND TECHNOLOGY

Introduction

17.1 India has had a long and distinguished tradition in science and technology. In the half-century prior to Independence, India produced many scientists who achieved world renown; generally, they were teacher—researchers in educational institutions. At the time of Independence, the industrial and technological base of the country was very small. Since then a scientific and technological infrastructure, covering a very broad spectrum of disciplines has been created. Scientific and technological accomplishments of significant magnitude have been seen in areas of high-technology like atomic energy, space and electronics, while closer to the lives of the masses, the success in attaining self-sufficiency in foodgrain production, based on genetic engineering, has been equally spectacular. Indian scientists and technologists have been able to fulfil national expectations when clear-cut objectives and tasks are indicated and necessary support provided. The true contribution of science is to endow a nation with competence and confidence, in terms of both these criteria, the self-reliance developed in many areas, and in terms of economic returns, India has reaped ample rewards from the investments made in science and technology.

17.2 For sustaining the thrust towards emergence of an industrialising economy with rising levels of scientific and technological maturity and self-reliance, a major effort in science and technology is clearly called for. The per capita income and quality of life that a nation enjoys is, in the final analysis, dependent largely on the technology it adopts, and which in turn has to be appropriate to its endowments, resources and skills. Any over dependence on imports from abroad could in the case of a country of India's size and complexity, involve a heavy price too large to pay :, hence self-reliance—which really implies scientific and technological self-reliance.

17.3 During the Sixth Plan there has been significant expansion and consolidation of the scientific infrastructure, resulting in a sound base for major application of science and technology for national development in the Seventh Plan. The resulting capabilities have been taken note of in preparing the plan for the Science and Technology sector.

REVIEW OF THE SIXTH PLAN

Institutional Arrangements

17.4 In the Sixth Plan, to give the necessary thrust to areas such as environment, ocean development and non-conventional sources of energy, new Departments were established—the Department of Environment in November 1980, the Commission for Additional Sources of Energy in March, 1981 and subsequently the Department of Ocean Development in July 1981 and the Department of Non-Conventional Energy Sources, in September, 1982.

17.5 A Cabinet Committee on Science and Technology (CCST) was constituted on 3rd March, 1981 under the chairmanship of the Prime Minister to provide policy guidance in all matters relating to S&T. A Science Advisory Committee to the Cabinet (SACC) was set up in March, 1981 ; Member (Science) in the Planning Commission is Chairman of SACC to ensure appropriate linkages with the Planning Commission. As recommended by the SACC, a National Biotechnology Board (NBTB), was established in 1982 as an inter-ministerial coordinating agency, to accelerate the pace of development in the frontier and emerging areas of biotechnology. This area has great relevance for agriculture, medicine and industry.

17.6. To deal with the problems of unemployment and manpower planning among science and technology personnel, a National Science and Technology Entrepreneurship Development Board (NSTEDB), was set up in 1982 to prepare a basket of employment opportunities, including self-employment, to arrange for training of S&T personnel in entrepreneurial matters and to channel institutional finance for promoting self-employment among scientific and technological personnel. For popularising science and to develop a scientific temper in the country, a National Council for Science and Technology Communication (NCSTC) was set up in May, 1982. These new organisational structures were created to initiate, promote, develop and strengthen S&T activities in the country.

17.7 There has been growing awareness of the need to promote a proper environment for scientific work so that scientists and technologists can make the most effective use of existing facilities, and so that they can perform the tasks assigned to them without experiencing any frustration. Government has approved several measures in this connection to provide more incentives and facilities to scientists and technologists.

17.8 The Technology Policy Statement (TPS) was announced in January, 1983. This is a major policy statement of Government covering a whole range of issues relating to technology ; indigenous development

nent, assessment, forecasting, import and subsequent bsorption, adaptation and further development, fis-al aspects, etc. To evolve mechanisms for implement-ng the TPS, a Technology Policy Implementation ommittee (TPIC) has been constituted by Govern-ent.

17.9 A special scheme to provide funds to some stitutions of higher education on a selective basis is ow being implemented by the University Grants ommission. The aim is to enable the institutions to engthen and modernise their infrastructure for un-rtaking work in frontline areas in S&T.

ogress and Perspective for the Future

17.10 There have been major accomplishments in ny areas of S&T during the Sixth Plan; these have significant impact on the socio-economic progress the country and promoting self-reliance. Some of se are briefly outlined below :

7.11 *Agriculture* : With the existing strong base agricultural research and education, agricultural ntists moved into the new areas of repetterning genetic architecture to increase productivity of s; induction of haploids through another and pol-id sorghum, hybrid pearl millet, dwarf wheat, are some of the important milestones. A sub-nce agriculture was thus transformed into a com-ial agricultural system through massive applica-of science and technology. The effort now called s an enlargement of the agricultural base to bring t increased production in low-productivity areas e country, and to improve yields in specific crops eat importance such as rice, pulses and oilseeds. 12 Basic research in agriculture has related to : on photosynthesis and photo-respiration; the opment of new rhizobium strains for nitrogen on; use of tissue culture techniques in important induction of haploids through anther and pol-lture; and genetic engineering related to animal es, especially viral genetics including gene splic-r vaccine production. A significant research ac-ishment has been the cloning and expression of e gene in rice. There will be a continuing major in basic work, particularly related to the new nologies. There is at present a major gap in nsfer of available knowledge to the field, along rovision of all the inputs necessary to make e use of the recommended package of practi-osing this gap alone will make possible large es in agricultural output, particularly in rice, oilseeds and many cash crops. A major area kness at present relates to agro-meteorology, ating a package of seeds, inputs and practice; l ensure that the best yields are obtained un-n weather situations. Efficiency in the use of water and fertilisers is another area of major research concern.

17.13 Nuclear energy · In the field of nuclear energy, capabilities have now been established covering the entire nuclear cycle : exploration, mining, extraction, purification and conversion of nuclear materials ; production of fuel elements for reactors; the design and construction of power reactors and their control systems, for units of 235-MWe capacity; production of heavy water; health and safety instrumentation; reprocessing of spent fuel; and waste management. In this area of high technology, it is the creation and substantial growth of the research base which has led to this degree of self-reliance. A major achievement in the Sixth Plan period was the commissioning of the Madras Atomic Power Plant, which was wholly designed, fabricated and set up indigenously, using locally produced fuel, heavy water, instrumentation and control systems, as also all items of heavy engineering. A 100-MW heavy water reactor, DHRUVA, which is a major facility for engineering research in support of the nuclear power programme and for production of isotopes, has been built at the Bhabha Atomic Research Centre (BARC). There has been a significant fall-out from the associated technological developments related to the nuclear programme. These are in the fields of : high vacuum, very low temperature, electronics and control systems, precision engineering, heavy engineering (with production of items such as calandria, fuelling machines, end-shields etc.), welding of all types, use of radio isotopes in agriculture and health, and so on. In the area of nuclear and related sciences, fundamental research of a high order has been carried out.

17.14 *Space science and technology*: Another area of high technology where there has been continuing and significant progress is that relating to the space programme. This activity was taken up because of the clear realisation that space-based systems have an inherent edge over conventional, purely ground-based systems for a country of India's sub-continental dimensions. In particular, an optimal mix of ground and space capabilities has been sought to be built up.

17.15 India's first indigenously designed and fabricated experimental communication spacecraft, APPLE, was launched in June, 1981 on the European Ariane launcher, and it successfully completed its mission in October, 1983. Bhaskara-II, a remote sensing satellite launced in November, 1981 by a USSR launcher successfully completed its 2-year earth observation mission. As against five flights projected for Satellite Launch Vehicle (SLV)-3/Rohini Satellite system during the Sixth Plan period, the programme was reviewed and closed after the successful completion of only two additional flights, viz., SLV-3-D-1

and SLV-3-D-2, since all the technological objectives were realised by then. The SLV-3-D-2 launched in April, 1983 from Sriharikota put a 42-kg. indigenous ROHINI satellite, carrying a smart-sensor payload, into the desired near-earth orbit.

17.16 Three major projects, the Indian Remote Sensing Satellite (IRS), Augmented Satellite Launch Vehicle (ASLV) and Polar Satellite Launch Vehicle (PSLV) were approved in June, 1982. ASLV is a follow-up of the SLV development programme, whose main objective is to upgrade SLV performance to be able to carry heavier payloads, e.g., launch satellites of approximately 150 kilogram mass in near-earth orbit. Some of the major components of the PSLV mission would get proven with this vehicle ; these include strap-on technology, on-board computer and the execution of yaw manoeuvres after launch. ASLV is scheduled for a first launch in 1986. The PSLV is designed to place satellites in the 1000 kilogramme class in a sun-synchronous polar orbit.

17.17 The Indian National Satellite (INSAT)-1B is a multipurpose satellite with activities covering telecommunications, radio and TV broadcasting, and meteorology (using a very high resolution radiometer). The basic concepts of this unique and complex satellite system were worked out by the Indian Space Research Organisation (ISRO); the satellite was built in the USA and launched by the United States on a space shuttle mission on 30th August, 1983. Another significant event related to space activities was the successful trip on the SOYUZ-SALYUT Mission of an Indian Cosmonaut, Wing Commander Rakesh Sharma, who performed several experiments in space.

17.18 Now that the space programme is increasingly an operational one, there are arising new developments which relate to the fullest utilisation of these operational capabilities. The overall management and coordination of the INSAT system rests with the INSAT Coordination Committee. Of the Departments represented in this Committee, the Department of Space has the responsibility for establishment and operation of the space segment, the Department of Telecommunications for the tele-communications ground segment, the Indian Meteorological Department for the meteorological ground segment and applications, and AIR and Doordarshan for radio and TV utilisation. One is, therefore, seeing not only a technical innovation in the practical applications, of space hardware specific to India for cost-effective enhancement of national services, but also a major organisational innovation which cuts across the traditional boundaries of government departments and agencies. In a similar sense when the 800 kilogramme Indian Remote Sensing Satellite becomes operational in 1986 after a launch from the USSR, it will be a major element in a space based remote-sensing system for national natur sources survey and management in agriculture, fo geology, hydrology and meteorology. To prepa this, a National Natural Resources Managemen tem (NNRMS) is under evolution.

17.19 In addition to the above, various ne innovative approaches are being worked out co ing software relating to the field of telecomm tions and to the radio and TV broadcasting se on an interdepartmental and multidisciplinary

17.20 *Ocean development* : There is increasi cognition of the importance of the oceans: fro viewpoint of national security; for ensuring eco equilibrium; and as an important source of foo many mineral, chemical and biological resour coordinated national programme initiated und Department of Science and Technology (DST oceanographic research and development becam nucleus for the setting up of the Department of Development (DOD) during the Sixth Plan. A portant development in this area was the signi the United Nations Convention on the Law of the which provided a framework for a new interna order for the oceans. The Ocean Policy Statem 1983 outlines the policies of Government with r to developing, harnessing and preserving ocean r ces and stresses the importance of scientific pro me for developing capabilities in this area.

17.21 Four scientific expeditions to Anta were organised in 1981, 1982, 1983 and 1984 a permanent research station has been established at Dakshin Gangotri. Scientists from the National tute of Oceanography (NIO) brought up polym nodules on a cruise in early 1981. DOD has f pursued this area and has completed the first of a project for identification of a mining site, th extensive regional surveys covering an area o million square kilometres and over ten thousand tions. The oceanographic research vessel (O "Sagar Kanya" and the fisheries and oceanograph search vessel (FORV) "Sagar Sampada" are operational.

17.22 *Science and Technology* : The progra of the DST for supporting research of a multid linary nature, and those in emerging frontline a science, made significant progress during the Plan. The funding provided has made a major on University research. A special programme of tensification of Research in High Pri (IRHPA) has played an important role in and supporting major national activities in the of immunology, visceral mechanisms, plasma p setting up of a major facility for high NMR, Indian Middle Atmosphere (IMAP), etc. A National Institute of Im set up under this scheme. Three Regional

Instrumentation Centres (RSICs) were set up at Nagpur, Chandigarh and Shillong for providing expensive and sophisticated research equipment/instruments to the scientific community as centralised facilities. Three major science and society related schemes, viz., S&T for women, technology development for Scheduled Castes and Scheduled Tribes and promotion of scientific interest in youth have been effectively pursued so that the benefit of S&T percolate more effectively to various target sections of the community. At the initiative of the DST, S&T councils have been set up in 18 States and 4 Union Territories. In addition, 13 States have set up separate Departments for Science and Technology. A sustained effort has been made to accelerate the pace of a large number of science and technology programmes which are relevant from the viewpoint of basic research, generation of knowledge and expertise, and which have societal application. The Department has been providing secretarial support to the Science Advisory Committee to the Cabinet (SACC) for processing its recommendations.

17.23 In areas such as earth and atmospheric sciences, calibration facilities, instruments development, composites and fibres, information systems, a good beginning has been made. These efforts, through consolidation and growth in the Seventh Plan, will lead to fruitful results.

17.24 Research and development activities in the field of biotechnology are of enormous significance and relevance to the future development of agriculture, medicine and industry. To ensure the growth of this area on a high priority basis in the country, under the auspices of NBTB, a long term plan of action in the areas of agriculture, energy, environment and health has been prepared. Mechanisms have been evolved to ensure the supply of radio-labelled chemicals, and for indigenous production (and, where needed, bulk import) of restricted enzymes, etc. Publications on the status of biotechnology in India, and recombinant DNA research, safety regulations for India, etc., have been brought out. Work has been initiated on programmes relating to manpower development and creation of infrastructural facilities (animal houses, culture lines, etc.).

17.25 *Scientific and industrial research* : In the area of scientific and industrial research, carried out under the Council of Scientific and Industrial Research (CSIR), a wide spectrum of problems have been tackled. These include : R&D work related to exploration of oil in the off-shore areas; and detailed studies on the alignment of pipelines, location of terminal points of pipelines on-shore, discharge of effluents from the terminal pumping stations and from possible spills along the pipelines. Based on processes developed at National Chemical Laboratory (NCL), Pune, Indian Petro-Chemicals Corporation Ltd., (IPCL) have put up a 10,000 tonne/annum plant at Vadodra for production of acrylates. A solvent extraction process for the production of benzene has been released to Bharat Petroleum Corporation for processing 1,70,000 tonnes of feed per annum; the process is also under consideration of the Cochin Refinery and the Salimpur Aromatics Complex. A totally indigenous 900-TPD plant for low-temperature carbonisation of coal, based on technology developed at Regional Research Laboratory, (RRL), Hyderabad, has gone into production in Andhra Pradesh. The Central Electronics Engineering Research Institute (CEERI), Pilani, has developed 500-KW and 1-MW fixed-frequency S-band Magnetrons and the design and development of 6-GHz, 20-W travelling wave tubes has also been completed. The RRL, Jorhat, has developed a flow improver, SWAT-106, for the transportation of Bombay High crude. The average power saving by using titanium substrate insoluble anodes in place of graphite anodes in the chloro-alkali industry is about 700 KWH per tonne of caustic soda; it is estimated that over 200 million KWH of power could be saved annually as a result of the use of anodes of the design developed by the Central Electro-Chemical Research Institute. The National Aeronautical Laboratory (NAL) has generated critical aerodynamic data for the Light Combat Aircraft programme. Under a major CSIR-Steel Authority of India collaboration programme, important R&D work is being carried out on coal beneficiation, development of steel for cryogenic application, combustions systems using oil-water emulsion, etc.

17.26 Three new laboratories were set up during the Sixth Plan : an Institute for Microbial Technology (IMT) at Chandigarh, a Regional Research Laboratory at Bhopal, and CSIR Complex at Palampur in Himachal Pradesh. In many disciplines, facilities have been created for advanced R&D work.

17.27 The two public sector undertakings, namely, the National Research Development Corporation (NRDC) and Central Electronics Limited (CEL), recently transferred from the DST to the Department of Scientific and Industrial Research (DSIR), have made significant progress in carrying the benefits of S&T to the country's rural population and are emerging as a potential source of appropriate technology to other developing countries. CEL has perfected indigenous know-how for the production of professional ferrites, automatic slide projectors and audio-visual systems.

17.28 *Medical research* : A major thrust relating to medical research was made in the Sixth Plan through the very significant enhancement in support for the Indian Council of Medical Research (ICMR), which is the apex body for the formulation, coordina-

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work of Regional Medical Research Centres has been set up to undertake R&D programmes on regional health problems. A network of 26 human reproduction research centres was established in different part of the country, in close association with the medical colleges, to carry out clinical studies on new and emerging contraceptive technologies.

17.29 Short course therapeutic regimens have been developed through controlled clinical trials, and are being introduced under field conditions in several districts in India for the control of tuberculosis.

17.30 Integrated methods for control of malaria and vectorborne diseases, including biological control methods, environmental improvement and community participation have shown promising results; these are particularly applicable to areas where the vector has developed resistance to chemical insecticides. A major outcome of these studies was the isolation and development of a bacterial larvicide, which appears to be highly effective against several species of mosquitoes.

17.31 Prompt and early treatment of acute diarrhoeal diseases with oral fluid therapy, irrespective of etiology, has been shown to reduce mortality in all ages to a low level. Pulse immunisation with oral polio vaccine has proved to be highly effective, and is believed to constitute an appropriate strategy for the successful control of polio in India. Isaptent indigenously produced through work at the Central Drug Research Institute (CDRI), Lucknow, has been shown to be effective in producing cervical dilatation similar to that obtained with the much more expensive imported lamnaria tent. Immunological approaches to contraception are now being pursued intensively as a multi-institutional technology mission. In the area of nutrition, fortification of common salt with iron as a measure to prevent anaemia in the community has been successful.

17.32 *Other achievements include* the demonstration of the successful use of multi-purpose workers and primary health care workers in the recognition and management of common psychiatric problems in the community, launching of the National Cancer Registry, and the setting up of a demonstration module for testing the feasibility of utilising the primary health care approach for the prevention, detection and management of rheumatic fever and rheumatic heart disease.

17.33 Health is included as one of the important points in the new 20-Point Programme. The solution to a large number of the health problems in the country lies in development of appropriate manpower on a sufficient scale to provide adequate coverage; integration of the indigenous and modern systems of medicine; close coordination with sectors such as food and nutrition, water supply, sanitation and hygiene; plementation of the expanded programme of im nisation; and in particular, closing the gap betv available knowledge and its application. In addi there is need for research in the bio-medical are the frontiers of modern science as also to couple medical research system much more effectively the health care delivery systems in the country.

17.34 *S&T in socio-economic sectors* : The S aspects relating to the major socio-economic sect are given in the respective chapters; some illustrat highlights from sectors where significant S&T wo has been carried out are summarised in the follow paragraphs.

17.35 A major development in the field of ener relates to the increasing and significant degree of se reliance in the manufacture of equipment for gener tion, transmission and distribution. The work initiate in the area of High Voltage Direct Current (HVDC transmission has great promise for the power secto

17.36 Electronics and associated areas of informa tics and telematics is one of the key areas of develop ment in the world today. It permeates every sector o human activity. The S&T base in electronics is princi pally spread over a large number of national labora tories and ministries|departments. A number of sys tems engineering units have successfully executed or are executing major electronics systems for users in the defence, oil and power sectors. The operationalisation of the Semi-Conductor Complex Ltd., (SCL) at Chandigarh, and other major developments in the area of professional electronics equipment and system have established major capabilities covering both research and development and production.

17.37 A well-planned programme of upgradation of technology has been carried out in the areas of machine tools, automotive and electrical equipment, earth-moving and construction equipment, oil exploration equipment and chemical equipment industry. In all these areas, new products have been introduced and manufacturing technology upgraded. The large industrial establishments, such as SAIL, BHEL, HMT, IPCL, etc. have set up sizeable in-house R&D establishments. Three industry-associated organisations, viz., Central Machine Tools Institute (CMTI), Automotive Research Association of India (ARAI) and Electrical Research and Developmental Association (ERDA) have done very useful development work. It has been possible to develop new processes and products like fluidised bed boilers for utilising low grade coals, valves for oil field applications, new ranges of machine tools, photovoltaic systems for offshore platforms, etc.

17.38 The Magneto Hydro-Dynamics (MHD) programme at the Tiruchirapalli unit of BHEL, develop

lent of larger capacity fluidised bed combustion unit, quipment for co-generation plants, cryobiological ontainers, super-insulated containers for transportaon of liquid gases etc., have also made significant rogress.

17.39 In the oil and natural gas sector, remarkable chnological and manufacturing achievements have en made across the entire spectrum of : exploration d extraction; prognostic surveys; studies and instigations in deep drill investigations, both offshore d onshore; oil production techniques and pipeline cilities; design and manufacture of offshore rigs and atforms; underwater technologies; offshore communcations, etc. Refinery capacity has expanded steay and substantial progress has been made in energy nservation as regards energy consumption in exist- refineries. New facilities for lubricant evaluation ve greatly helped in successful formulation of new ricants.

ne General Issues

17.40 In the preceding paragraphs a brief account been given of some of the major accomplishments S&T only to highlight the fact that there has been nificant progress in a large number of areas. While re are weaknesses and gaps, and the capabilities t exist are somewhat uneven, a sound overall base now come into existence. There is a climate of fidence which needs to be made use of fully.

7.41 An account like this would be incomplete if ic of the weaknesses and imbalances that exist are highlighted. Some of these are briefly indicated ow.

7.42 It has to be recognised that S&T has been of the most dynamic aspects of the modern world. a result of the symbiotic relationship between varisectors of science and of technology, advances in one sector have triggered major developments in y others. Thus advances in micro-electronics have sformed the fields of computers, communications, digital electronics, and these in turn have transed informatics, industrial electronics, consumer tronics, space sciences, etc. This is also true of future of biotechnologies over the next few decadagriculture, biomedical areas and industry. Thus, significant advances have taken place on the ce and technology front in India over the past decades, the gap has significantly widened bet- what obains in the country and that in other nced countries, in terms of capabilities, due to much faster rate of progress in those countries. e is, therefore, no room for complacency on the of our past accomplishments. It is for this reason for the Seventh Plan, emphasis is being laid on new developing areas, such as micro-electronics informatics, biotechnologies, materials technologies, the new frontiers in chemistry, oceanography and so on. In these areas the major advances taking place are likely to create completely new approaches and techniques, and introduce new concepts and opportunities which are not only highly relevant to national development, but very important from the viewpoint of national security as well as international competitiveness.

17.43 Within the country there are enormous differences between infrastructural facilities and capabilities that are available in specialised scientific agencies and national laboratories, in the industrial undertakings, and in the educational system. The latter, in particular, has been allowed to run down to an unbelievable extent. This situation needs to be remedied rapidly.

17.44 The coupling between the science and technology infrastructure and capabilities and the production system in the country is weak. This has led to an insufficient use of the science generated and a lack of appreciation by decision makers in government and industry of the capabilities in the universities, national laboratories, and scientific agencies. There is often a feeling that the fruits of science and technology are not reaching the bulk of the population, and not contributing in sufficient measure to economic and social growth. For science and technology to be effectively applied, there is need to complete the total innovation chain consisting of basic research, applied research, design and development, prototype fabrication, upscaling, extension, awareness building, production engineering, design and consultancy, and production and services. It may not be possible to accomplish this immediately in all sectors; what is necessary is to start on a significant basis in a few major socio-economic sectors of importance during the Seventh Plan.

17.45 The total resource of S&T personnel in the country, compared to the population and the magnitude of the tasks before us, is small in contrast to what obtains elsewhere in the world. The quality of these personnel varies very widely : furthermore, large numbers of these are not actually engaged in activities that can be construed as scientific or technical. A clear manpower development, planning and placement policy is called for to match the numbers and actual training of personnel with the needs of the country.

17.46 There has been an increasing allocation for S&T activities over the past three decades. From Rs. 20 crores in the First Plan the total allocation (Plan & Non-Plan) for the S&T Sector rose to Rs. 3460 crores in the Sixth Plan. This increase is significant. However, as in the case of other sectors, some part of what has been allocated to S&T as Plan resources has had to be used to cover the gap in resources for non-Plan activities arising out of inflation

and inadequate increase on the non-Plan side. It is important to ask onself : what is the cost of not doing research ? This will be immediately reflected in a lack of self-reliance, increased vulnerability and dependence on the outside world, inability to take advantage of recent advances in S&T to increase productivity and efficiency and failure in accomplishing end objectives in better and newer ways and loss of international competitiveness, leading to further dependence on aid etc.

17.47 One of the major reasons why it has not been possible to successfully exploit the scientific research carried out, has been the lack of emphasis on engineering in product development. This will call for a new strategy, like creation of task forces, linkages with operating companies at an early stage, more effective deployment of consultants, etc., so that scientific advance is transformed into technological advance and innovation.

17.48 There is concern at senior levels of the scientific community that the very best talent in the country, who would be leaders of the scientific effort if they came into the sector, are being lost either to opportunities available abroad or to other areas of endeavour in the country. This is resulting in gaps in the ranks of leadership and excellence. If there emerges in course of time relatively mediocre leadership in science, it will become difficult to retrieve the situation, since mediocrity tends to breed mediocrity. There has to be a determined effort to attract some of the best and well-trained among our students to science and technology and to induce them to take to research, as a career. For this, not only it is necessary to provide them new and major challenges that will stretch them to the full, but also the facilities for such work and amenities and incentives relating to pay scales and emoluments, promotions and career advancement, mobility and particularly housing.

Approach to the Seventh Plan

17.49 In the Approach to the Seventh Five Year Plan, it is stated : "The guiding principles of the Seventh Five Year Plan should continue to be growth, equity and social justice, self-reliance, improved efficiency and productivity". In addition, it has also been stated that, in the Seventh Plan, there will be an emphasis on policies and programmes which will accelerate growth in food production, increase employment opportunities, and raise productivity. It is against this broad conceptual framework that the strategies for the S&T sector have been formulated.

17.50 The large infrastructure and capability in the field of science and technology have yet to be coupled meaningfully to activities that relate to the accomplishment of defined national socio-economic goals. For this, science and technology should be an integral part of all sectors of national activity, particularly the major sectors, such as chemicals, various areas of engineering, fertilizers, industry, gation, etc. These efforts in these sectors have, far, concentrated on immediate short-term implem tation aspects and corresponding investments, duction, etc. The realisation is largely missing if S&T aspects are adequately covered, we can m up for deficiencies in natural resources, reduce mand on capital and increase efficiency, producti and quality. Thus an important element in the proach would be to make science and technology essential and integral part of all major socio-econon sectors, to develop capabilities essential for fulfilme of S&T tasks in these areas, and to undertake Scien and Technology missions that are well-defined.

17.51 As a first step, it would be necesary to co solidate and modernise the infrastructure in all t areas of relevance for the future, in terms of bo physical facilities and human resources. It would necessary to establish linkages between the differe sectors of education, scientific research, technolog development, productive activities in agriculture, i dustry etc. and government decision-making struc tures. The S&T component of the State Plans wi have to be worked out in detail by the States. Th area of rural development is one which has not re ceived adequate S&T back-up so far; the plans for th application of S&T for rural development should mes closely with the State Plans. There will be need fo a major effort to develop a scientific temper and fo popularisation of science. Special efforts will have to be made to involve voluntary agencies in these programmes.

17.52 There are major new areas in S&T emerging on the world scene, such as micro-electronics, Informatics and telematics, robotics, biotechnologies, material sciences, oceanography, instrumentation, several areas in chemistry, modern biology and earth sciences and space technologies. These should be reorganised as thrust areas and should receive significant support.

17.53 Priority will be given to programmes in the field of education, particularly those relating to science and technology. It is essential to evolve mechanisms to attract some of the best brains of the country to science. There is need to grow centres of excellence in the educational system, and in the national research system including the socio-economic sectors. Excellence and generation of leadership are vital for the sustained viable growth of science.

17.54 The Technology Policy Statement [TPS] has been a major enunciation of Government policy during the Sixth Plan period. It is important that measures are taken to ensure implementation of this policy. This will involve : technology

and forecasting; support for development of indigenous technology, and demonstration to prove its viability, through upscaling, use of design and consultancy engineering and establishing linkages between different sectors; ensuring meaningful absorption adaptation and improvement of imported technology; ensuring that technology inducted will be in harmony with environmental considerations and needs of employment, etc. There has to be commitment of industries to R&D, and an appropriate percentage of sales turnover should be earmarked for R&D expenditure. Special emphasis is called for concerning S&T efforts to enhance productivity in the various major socio-economic sectors.

Aspects of policy formulation and implementation

17.55 The success of the efforts outlined in the above approach will depend on the institutional framework for policy formulation, decision making, funding and implementation including project management, monitoring and review. Structures have already been created in the Sixth Plan at the highest level, viz., a Cabinet Committee on Science and Technology under the chairmanship of the Prime Minister and a Science Advisory Committee to the Cabinet (SACC) under the chairmanship of Member (Science), Planning Commission. There will be need to implement the recommendations made by SACC expeditiously. This institutional framework will continue to play an important role, and will need further strengthening. Similarly, the S&T Division of the Planning Commission will need to be appropriately structured and strengthened because the Planning Commission and Department of Science and Technology will have to work closely on many issues involving long-range perspectives, inter-ministerial coordination etc.

17.56 As recommended in the Technology Policy Statement, strong central groups will have to be constituted in each of the major Ministries to work on a continuing basis on the S&T component in that sector. These will be responsible for collection, collation and dissemination of information for planning, analysis and coordination. They will also be involved in technology forecasting and assessment and systems analysis. The recommendations of the Technology Policy Implementation Committee will need to be implemented expeditiously. Linkages between industry and research are best built when goals have been properly defined and specified and tasks formulated. These will have to be laid out in carefully drafted Memoranda of Understanding. Linkages between S&T activities, financial institutions and development banks will need to be strengthened. The appointment of scientists and technologists to the boards of directors of financial institutions can assist the institutions to play their role effectively; and this can be further supported by these institutions nominating scientists and technologists to the boards of directors of enterprises to which they have extended substantial financial assistance.

17.57 Appropriate management structures will be created for various large national facilities to ensure their effective and optimal utilisation.

Monitoring Aspects

17.58 The present internal monitoring mechanisms in each of the scientific agencies will have to be adequately strengthened, where necessary through the involvement of experts. External monitoring of overall progress (fiscal, time-scheduling, major hold-ups, problems in coordination, etc.) for all major S&T projects/missions will have to be done at the national level through the constitution of appropriate task forces, steering committees, etc., by the Planning Commission. Experts from various disciplines and organisations will be associated with these.

Implementation Aspects

17.59 Implementation of the various recommendations in the plan document will have to be given highest priority. Innovative approaches to ensure implementation are called for. The present administrative and management systems clearly need substantial change; in particular, the practices normally adopted in Government are used for the S&T sector also, where these are wholly inappropriate; the S&T sector calls for a more flexible approach which can cater to innovation and rapid change. Without urgent and deliberate actions, the investment in S&T cannot yield returns commensurate with its true potential.

Science and Technology Missions and Linkages

17.60 The basic efforts in the Seventh Plan will be to ensure that science and technology has a significant positive impact on the functioning of the country, through improvement and enlargement of its agriculture, industry and various infrastructure sectors. For this, S&T has to relate closely to the objectives in these sectors, to the investments and economics involved and to the available materials and skills. This calls for goal-directed S&T efforts. A mission-oriented approach to technological development can foster relevance and provide motivation, automatically establish organic linkages, which are live and working, between sectors which otherwise tend to remain compartmentalised, and would also

introduce the sense of urgency required to meet time-targets.

17.61 In the Seventh Plan, it is planned to take up some missions which will have a large S&T component, which relate to major socio-economic sectors and which will have high visibility when accomplished. In the Report of the Steering Group on S&T and Environment there is an illustrative list of missions. This has been further shortened (Annexure 17.1) and is under consideration for implementation. For each mission there will be a lead agency and other associated agencies/institutions. All of these will have clearly defined responsibilities, resources and commitments as agreed to at the start. Empowered task forces and working groups will be set up on an interagency basis to work out detailed implementation strategies for missions. A programme office would be set up for this purpose in the Department of Science and Technology. Appropriate management structures will have to be designed according to the mission to be performed, and an Inter-Ministerial Mission Approval Board will be constituted.

Linkages

17.62 Most natural linkages arise between two or more organisations when they are jointly engaged in accomplishing a task. However, there will be other measures needed for this purpose, such as representation of senior persons from R&D establishments on the boards of industrial enterprises and vice versa. Agreements would have to be concluded between universities, research laboratories and industry for exchange of personnel. The need for mobility of S&T personnel is essential. Consultancy organisations should be encouraged because they can act as agents for collecting and using the experience, techniques and people available in different organisations.

Thrust areas in science and technology

17.63 India is a large country faced with a broad and complex range of problems. With the present constraints on fiscal and human resources, it would not be possible to deal with all the problems or all areas of S&T at the same time. Therefore, there has to be a degree of selectivity and allocation of priorities. There is need to not only define areas of strength for consolidation and development, but also areas of weakness that require corrective action, together with identification of gaps, particularly in newly emerging areas of great promise. These will constitute carefully selected thrust areas for concentration during the Seventh Plan period. There would be need to specify the level of capability that would be attained.

17.64 In some areas, the thrust could be to u efficiently the existing knowledge and capabilitie the country to deal with short-term objectives. others, it could involve the generation of know and technology which would be relevant for Eighth Plan and beyond. These would be th areas where, without undue handicaps, it would possible to work at international levels in the co try. In the case of thrust areas that have e application potential, it will be necessary to de the total process and indicate where scientific deavour ends and operationalisation begins. these cases, manifested most clearly in sectors health, field-level tasks that are essential and nec sary for any meaningful application will also have be given high priority and encouraged. A large nu ber of replicable demonstration projects, on an in grated basis, at the micro level, will have to be tak up. Only thus will the gap between available kno ledge and its application be closed. Thrust are need not be only in the high technology areas.

17.65 The information and communications se tors, and instrumentation, are all essential infrastru tural elements for the total S&T plan; these will ne to be included in the thrust areas.

17.66 There is widespread concern regarding th quality and extent of the technology base in th country. Engineering education and research nee significant support. It would be necessary to estab lish a mechanism which will enable funds fro research stations regionally distributed, or create for sectors of industry in cooperation with Industry The mechanical and electronic engineering areas re quire immediate attention. There is need to estab lish a mechanism which will enable funds from Government as well as from industry, including the public and private sectors, to be received and used for engineering research.

17.67 It is necessary to provide at least a minimum critical support in chosen specific areas so that viable groups and capabilities could emerge. An indicative list of thrust areas is given in the Report of the Steering Group. It is hoped that once all the thrust areas are identified and notified, it will lead to increasing numbers of those starting on research making their careers in these, as also a redeployment of the existing infrastructure and capabilities towards these. A major effort in the identified areas is called for in the Seventh Plan itself.

Development of S&T in the States

17.68 Upto now, allocations in the State sector for science and technology have been very small; these need to be significantly stepped up. A large part of the developmental activities in sectors affected

ing the major part of Indian society and particularly the poor, is carried out by the State Governments. It is, therefore, essential to ensure that the S&T component in the State sector is fully developed to support these activities. There is need to make an analysis of the S&T component of the State Plans; this will be the responsibility of the State S&T Councils and departments and the Planning departments. It will then be ensured that the necessary S&T work is carried out making fullest use of the existing infrastructure. The main functions of the State S&T Councils will be to provide linkages between operational departments of the Government, research and educational institutions, and productive sectors in agriculture|industry, etc; prepare an inventory of voluntary agencies, and educational and R&D institutions; ensure application of S&T to solve real problems encountered in plan implementation; promote location-specific research; demonstrate through model experiments, utilisation of local capabilities and local resources on an integrated basis; and ensure utilisation of the existing capabilities in the States set up by various Central Government Organisations.

Science & Technology and Rural Development and for reducing regional imbalances

17.69 The real impact of S&T on rural development is yet to be made. There is considerable scope for mobilising the large S&T potential, expertise and facilities in the country for accelerating the pace of rural development and widening its horizons. The needs in the countryside will have to be carefully analysed from the viewpoint of the contribution that S&T can make. To assess the real needs, inputs from those who have lived and worked in rural areas and who understand the interplay of economic, social and cultural factors in that environment would be essential. Positive policy directives will have to be given at the highest level, as it is necessary to bring about a change in the value system and ethos of the scientific community, so that work relating to rural development will be considerd as important as basic scientific or industrial research.

17.70 Some of the measures recommended for more meaningful application of S&T to rural development include :

(i) all S&T laboratories, agencies, universities, IITs and other academic and research institutions analysing the contribution that they can make to rural development and allocating an appropriate part of their resources and efforts towards realising it;

(ii) the development of the right value system in these institutions, to ensure that those scientists involved in research on rural problems are given appropriate credit and recognition;

(iii) scientists participating fully in the field of application and technology development in rural areas;

(iv) support being given to rural development groups on a long-term and selective basis;

(v) a specific Plan allocation being for this activity in the allocations of all concerned sectors, and

(vi) a concerted effort being made to effectively involve artisans not only for transfer of technology but for the expression of their creativity.

17.71 A national network covering all those in the field of S&T for rural development should be developed. Highly innovative efforts in this context in different parts of the country are already underway. These need to be sustained and replicated with necessary modifications. The importance of deploying S&T personnel who could spend extended periods in rural areas and could establish rapport with the people and their problems needs to be stressed.

17.72 Regarding the application of S&T for reducing regional imbalances, the State S&T Councils and the Regional Research Laboratories of CSIR will have to play an important role, particularly in the use of S&T to promote locale-specific developmental activities and research problems. The scientific agencies will also have to initiate major projects on regional development for which they should set aside specific allocations. It will be necessary to have district level organisations in the form of district councils which could arrange for the involvement of large numbers of S&T personnel from the agricultural, medical science and engineering systems in the region. Specific regional development missions could be identified; S&T inputs will have to be provided in all the sectors, and agriculture with its related areas made into a base for developing a science culture in the rural areas.

17.73 Voluntary agencies have an important role in the application of S&T for the social and economic development of rural people. A list of voluntary agencies needs to be prepared and updated. S&T activities will have to be based on these vast reservoirs of social activists, with extensive field experience. Processing by Government funding agencies of the proposals by voluntary agencies and those relating to rural development need to be streamlined and expedited. Home science colleges and other such institutions could be more effectively involved, for acting as catalysts in some of the forward looking

areas in rural development.

S&T and Specific Groups

17.74 One of the principal Plan objectives is to ensure equity and social justice. Poverty amelioration and employment programmes are some of the specific mechanisms relating to these objectives. It is clear that S&T must be brought to bear on these programmes. There is need for a range of S&T activities specifically oriented towards weaker sections of society.

S&T for Weaker Sections

17.75 The programmes will be directed towards reduction of drudgery, increase in efficiency and productivity, reduction of hazards, etc. Specific efforts are called for to survey and identify areas of need and required technologies, and to carry out programmes for field applications, and prototype development through demonstration and field trials. Support will need to be provided for a large number of training programmes in technologies which are of day-to-day use among the weaker sections.

S&T for Women

17.76 Programmes to improve the quality of life for women through application of S&T, including enhancement of employment opportunties as also those aimed at ensuring greater contribution by women to science and technology, would require more emphasis. Trained women S&T personnel could be utilised in a major way in a large number of areas like family planning, health and nutrition, post-harvest technologies and major national programmes such as ICDS, MNP, IRDP, etc. The efforts of the scheme of S&T for women will have to be continued by involvement of voluntary agencies, Home Science colleges and women workers at all levels.

Involvement of Young Scientists in S&T Tasks

17.77 It is important that the best use is made of young scientists, including those just out of universities in terms of their basic training and areas of interests. The formation of interdisciplinary teams or groups of young scientists in universities and research institutions should be encouraged and they should be induced to undertake creative S&T research of relevance. Young scientists should be given opportunities to work on research projects of interest to them, and present them for inclusion in R&D programmes in their respective institutions. To encourage young artisans and those endowed with creativity in rural areas or remote parts of the country encouragement needs to be provided so as to support them for developing particular skills with the help of S&T. Young scientists employed in academic or rese institutions should be allowed to do field work rural areas for periods ranging to about two y

Role of Retired Scientists in S&T Activities

17.78 There are many retired scientists in country who continue to be active and are de motivated and who would wish to participate in national development activities. To make effe use of this large potential, specific schemes will to be worked out. Retired scientists need not be encouraged to work in the institutions from w they have retired but also in rural areas and o institutions.

Popularisation of Science, Dissemination of Scien and Technological Information and Growth of Sc tific Temper

17.79 The need to disseminate scientific info tion among various segments of society, to p larise science and to create a scientific per has been well recognised. In in a world geared to science and technology, s degree of understanding of science and technolog necessary for all citizens. The promotion of aspect, therefore, has to be an important goal science popularisation activity. Scientific tempe more an attribute of the human mind and of social decision-making process than mere knowle about things which are scientific. It is more rel to the method of science than to the content science. The creation of a scientific temper rela to scientific developments and knowledge and t implications are basic to the large-scale growth utilisation of science by society.

17.80 In the Sixth Plan, as an institutional mec nism, a National Council for Science and Technol Communication (NCSTC), was set up. The role this Council would be to encourage and facilitate activities aimed at dissemination of science and cr tion of a scientific temper; more particularly, to chestrate the various on-going activities in this so as to render them more effective and mutu supportive. The National Council of Science M seums (NCSM) has made significant progress in ing up District Science Centres. This activity be expanded. An important role of these cen should be to provide support to the large numbe voluntary science movements and science clubs have emerged, and would continue to emerge over the country.

17.81 Professional academies of science engage in popularisation of science discussi social issues with science content, and in and eliminating the occasional incursions of science.

17.82 Universities and colleges, with their large population of students, can also play a similar important role. All scientific agencies, departments and laboratories should have an unwritten mandate to popularise science through various means. The full potential of science has to be utilised for eradication of irrational attitudes which tend to hold back the nation from the path of progress.

17.83 Many locations in rural areas are provided with Krishi Vigyan Kendras, District Industries Centres, various Health Centres, Paryavaran Kendras, etc. These should all become places for dispensing not only know-how and information, but also know-why and understanding. There are a number of scientifically-oriented voluntary agencies working in rural India. These need to be promoted and assisted.

17.84 A number of popular science journals have come up during the last few years. This activity should be encouraged and support provided for their growth. There is a lack of good science communicators. Training programmes will be organised during the Seventh Plan to rectify this lacuna. There is need to establish a National Science and Technology Information Bureau through which information will be readily accessible.

17.85 The role of the media, including the press, radio, television and films is of crucial importance. A programme that does not enlarge understanding is not an educational science programme. We need to, and can do, with our media what nobody else has done, aimed as it is to a large multilingual audience, and with a present illiteracy figure of 64 per cent. There is, thus, a need for special programmes to develop the art and science of using electronics media in our context. This may be done by building around some of the nuclei which have already developed: an Academy of Audio-visual Science Communication can be thought of to catalyse such movement. It may be useful to institute a number of prestigious awards for science popularisation through press, field activity, radio and television.

Science and Technology and Education

17.86 From the viewpoint of science and technology, it must be recognised that it is the educational system which produces the manpower necessary for the growth and application of science and technology. The health of the science and technology sector is intimately connected with the health and well-being of the educational system. In the present age, science and technology has to be an essential part of the educational system. The scientific method based on a questioning approach, the absence of a rigid hierarchy, the ability to make accurate observations and to do experiments is more important than mere knowledge. Education must ensure that it equips the individual to emerge into a world that is today largely fashioned by science and technology and is in a process of continual change.

17.87 Education would, thus, need significant restructuring during the Seventh Plan period; it must contribute to the development of quality, of excellence and of leadership. It is essential to work out ways and means whereby highly capable individuals are identified and provided with opportunities for true development of their innate gifts.

17.88 The higher educational institutions with their research facilities are a unique base for the training of competent scientists and technologists. There is deep concern about the extent to which the university science system has been allowed to run down through lack of support in the past. Allocations under the scheme recommended by SACC for the selective strengthening of infrastructural facilities in the university system need to be enhanced. There has to be a major effort to improve the quality of science teaching at school levels. There is need to make increased use of audio-visual aids and science teaching kits. In addition to the prevalent National Science Talent Search Scheme, other special schemes need to be initiated for identification of gifted students.

17.89 In the undergraduate colleges, at least 25 per cent seats should be available for admission on the basis of the results of a talent search examination. Colleges with highly advanced facilities for training of especially meritorious students need to be set up in all the States. Multi-purpose employment-oriented training courses should be introduced at the graduate level. This would lead to self-reliance on the one hand and augmentation of employment opportunities on the other. College Science Improvement Programme (COSIP) should be further strengthened and diversified. Training and retraining of those who are teaching science must be started. There is need for continuing research on low-cost, appropriate instruments needed in the schools, colleges and in the universities on a large scale.

17.90 Environmental education should be introduced at school level and integrated life science and biotechnology at graduate levels. Engineering education and research are key elements for technology generation and industrial productivity. Mechanical engineering, fabrication technologies, modern electronics and information technologies are critical for new industrial development.

17.91 For advanced level research and education, centres in specialised, newly emerging areas of S&T need to be set up. In the Sixth Plan, the need to have complementary funding by industry and concerned departments was emphasised. This has to be

ensured in the Seventh Plan. The programmes for Centres of Excellence and schemes on Regional Sophisticated Instrumentation Centres (RSIC) and University Science Instrumentation Centres (USIC), need further augmentation. The scheme of National Professor and Professors of Eminence should be augmented and strengthened. There is need to weld the new field of informatics to the educational system. There is a large amount of obsolete equipment which needs to be discarded. For import of sophisticated equipment, chemicals and enzymes, the present procedures are complicated and time-consuming and need to be changed. The present recruitment procedures also require change. There is a significant amount of inbreeding at present. Industry must be made to spend an appropriate amount on research in universities. While setting up new S&T institutions for research and development in the Seventh Plan, there is need to ensure that these have appropriate formal linkages with the educational system.

17.92 In enterprises operating in areas of high technology, there is increasing need for continuing education, particularly in the form of refresher and retraining programmes. Industry in India, specially the public sector, would have to devote considerable attention to this aspect of continuing technical education for its scientific and technical personnel. The existing industrial training institutes, which are the major source of skilled artisans, require considerable upgradation.

17.93 Universities and colleges should be encouraged to take up applied research of value to the regions in which they function. Basic research is important not only for its own sake but also because of the solid foundation it provides for applied research and development. Adequate funds must be provided for basic research, particularly in the education system.

17.94 Agricultural education carried out through 23 agricultural universities and ICAR institutions needs to be strengthened, especially in terms of institutional framework. Short courses in agricultural management and educational technology should be included in training programmes at the summer institutes. Special emphasis must be laid on human resources development.

17.95 In medical research and education, there are several problems. Undergraduate medical education has to undergo a thorough overhaul, not only to imbue medical students with the excitement of modern biology, which will have a major impact on the practice of medicine in the years to come, but also to orient them to the health needs of society; in particular, there is need to give emphasis to health promotion and disease prevention rather than the curative aspects alone. The Rural Orientation of Medical Education (ROME) scheme needs to be vised and implemented vigorously. It is neces to provide suitable measures to attract talented dical and non-medical scientists to a career in m cal research.

Nurturing and Developing Excellence in Science Technology

17.96 Apart from the cultural aspect, work at most advanced level in S&T is essential for reliant development since it has the inherent p bility of opening up new approaches to accele deelopment through innovative research and in mentation. Such challenging scientific work courages originality and develops leadership; it only be carried out in an environment characte by excellence. The search for excellence calls uncompromising standards, integrity, dedication a spirit of self-confidence.

17.97 The increase in the number of scientists gaged in R&D work during the last few decades not been matched by an equal improvement in lity, even though there have been peaks of high complishment. There is need, therefore, for phasis during the Seventh Plan on quality, and in direction of creating and nurturing a sufficie large number of centres of excellence.

17.98 Unless a true enthusiasm for science generated during school and college stages, even very intelligent and scientifically minded, who w achieve much in science, would turn to safer more lucrative professions, as is already happen We have to be particularly sensitive in spotting t and creativity, wherever it exists and providing portunities for its emergence. In the Seventh P an attempt should be made to ensure that only dicated students are admitted to Ph.D. program in science.

17.99 Excellence is a vulnerable entity, even it is established. Institutions of excellence have strive for and maintain excellence in all aspects their functioning. Attention to these aspects in physical and managerial environment of science sho be increased during the Seventh Plan. To nurt and develop excellence, it is essential to exer great caution in inducting people into R&D insti tions. The standardised procedures adopted by Pu He Service Commissions are not entirely suitable scientific recruitment and aspects of advancement scientists. There is need to be particular in urg ing those who are to perform leadership roles. Lea of science would, in addition to competence, exhibit a 'taste' in the selection of problems and proaches. Mediocrity at these levels will only re in support for larger masses of mediocrity, would fatal for the pursuit of excellence. All scientific

hnologists must learn to be evaluated by others, n if these others are administratively their juniors. cellence, wherever it exists, should be made visi- Among other things, this calls for a system of ards and recognition.

7.100 Knowing when to terminate some activities as important as starting new areas of work, in king to maintain a climate of excellence. Cross- ilization between different persons, groups and niques in research institutions, university depart- nts and in production and industrial organisations, nore than just desirable; it is essential for excel- e to flourish. New developments significantly end on inputs from outside a given field. Modern arch needs several large facilities which cannot wned and operated by a single institution. These ld have to be set up nationally.

7.101 It is desirable to develop industry-oriented tutions as centres of excellence in selected areas. ng the Seventh Plan, such centres should be set selected fields around industry, in close associa- with the academic institutions and national labo- ies. It has long been recognised that creative cannot be administered or controlled in the manner as general administration. Existing mmendations in this regard should be imple- ed.

102 It is essential that appropriate cadre-age ing be done to ensure that maturing organisa- are not peopled only by the older generation, atter how bright or experienced.

Research

103 Since Independence, as has been men- earlier, there has been significant development S&T sector as a whole. A large part of this pment has resulted in quantitative expansion ny institutions. A number of institutions, spe- designated for basic research, have been sup- and have grown in the past. Areas where esearch carried out in India has had significant tional recognition are: several fields in pure matics and statistics; cosmic ray physics; solid hemistry and surface sciences; cosmo-geophy- olecular and cellular biology, immunology, , structure and conformational aspects of bio- s; liquid crystals; order-disorder phenomena; and high energy physics and astrophysics ; eric studies; natural product chemistry; phy- etallurgy; optical and radio astronomy, etc.

04 A sector of great importance for basic re- namely institutions of higher learning and ies, needs to be supported in a bigger way h greater financial inputs, better management e and a more conducive environment for research.

17.105 Basic research is concerned with the discovery of new knowledge and with increasing our understanding of natural phenomena. Basic research is not directed towards solutions, but is at the frontiers of knowledge and the quality of such work and achievements have to be judged by the entire international scientific community. Quite clearly those who would accomplish such research have to possess capabilities necessary for work at the frontiers of science on a competetive inter-national basis. Another important aspect of fundamental research is its essential place in the system of education. Higher education is primarily the responsibility of the universities, and quite clearly there must be basic research in the universities if education has to have any quality. All basic research will, of course, not be done within the universities. There will be need for basic research in the national laboratories because working at the frontiers of knowledge will sharpen the researchers' capability to perform the many other tasks on which they are engaged.

17.106 The new frontiers are largely in interdisciplinary areas. A related point which needs emphasis is that just as working at the frontiers of our present knowledge, on a competitive basis, and dealing with the challenges that this implies, sharpens abilities to deal with the many other problems of applied science and technology, so is a sound base relating to applied sciences, technology and industrial capabilities important for carrying out good basic research today. For this reason, basic research would benefit significantly from linkages with applied research and technological developments in industry.

Certain Inferastructural Elements for S&T

(a) *National Facilities*

17.107 There are many areas of research and development which require extensive, sophisticated, costly and modern facilities. These should be set up as national facilities, available to all scientists and technologists in the country who can make effective use of these. It is proposed to set up during the Seventh Plan period a few such common national facilities in priority areas. It would also be of great advantage for India to join international collaboration to derive the benefit of using similar unique international facilities.

17.108 With regard to national facilities, it is clear that only a limited number can be put up during the Plan period in view of the large outlays involved. The priorities vis-a-vis the most important facilities would have to be arrived at through discussions among the scientific community. There would have to be a project management structure to identify opti-

mal locations and ensure completion of the facility in a stipulated time and cost frame. Appropriate management structures would also have to be evolved to ensure that the facility is freely and easily available to all genuine users and, further, that the latter are supported adequately by funds for travel, for building equipment in their own institutions, which they can use in conjunction with the national facility, for developing that particular application in their institutions, etc. The Giant Metre Wavelength Radio Telescope, the Phytotron and the Synchrotron Radiation Source are some examples of such national facilities to be set up during the Seventh Plan.

(b) *Instrumentation*

17.109 Over the past few decades there has been a spectacular revolution in the field of instrumentation, particularly as a result of development in modern electronics and optics. A very large number of instruments are today defined as "smart" instruments; instead of being purely passive devices to observe, measure or display, they can now perform active and highly precise roles. Obsolescene in instrumentation is taking place at a rapid pace, with significant new facilities being added continuously.

17.110 There are many categories of instruments that are required. These are of various levels of sophistication, the demand profile in terms of numbers and total financial outlays varying very significantly.

17.111 There is clearly need for a sweeping change in our instrumentation sector, both in terms of production and utilisation of instruments, and for a new culture of self-reliance and self-confidence. A national policy in the field of instrumentation covering all aspects of the problem is essential and urgent.

17.112 A proposed national policy calls for perspective planning, covering both short-term and long-term strategies on the needs of different sectors, development of the industry, development of endogenous capabilities, import of necessary technology, import of high technology instrumentation, pricing policies, role of consultancy organisations with regard to instrumentation industry, etc. National facilities for the production of instrumentation required in large quantities for schools, colleges, industries, etc., as also for the production of selected sophisticated instruments will have to be created. A major effort will be required concerning research and development, which will have to be carried out in a variety of institutions, on a planned and coordinated basis, with inter-disciplinary projects, mechanisms of transfer of technology, etc. There is need to promote an instrumentation culture, both in terms of design and use of instruments and innovative ideas in this field, as well as m nance of instruments in the large-user sectors, as agriculture, medicine and industry. To cov these aspects, it is proposed to set up a Na Instrumentation Board, as recommended by SA

17.113 Instrumentation must be given a high rity as a key|ransectoral and underpinning ele for the development of science, technology, ind education and the many user sectors that f derive from it.

(c) *Information Systems*

17.114 The rapid advancement of scienc technology has resulted in a vast body of know which hitherto has been stored in printed fo published papers|reports, patent information a on. For this reason, libraries, documentation c patent offices, etc., have been an essential elem the infrastructure for science and technology. the increasing tempo of research and develo the stock of our knowledge is enlarging so that it is clear that the classical approaches a hitherto, relating to storage, retrieval and util of information, will no longer do. The solution making fullest use of the new developments r to computers, informatics, telematics, micro-rec etc., rapid advance in these is another major teristic of our times. It is clearly necessary to viable science and technology information based on these new capabilities.

17.115 For meaningful scientific developme quality of manpower, and of the information b even more important than the other physical a It is, therefore, proposed that during the S Plan, emphasis will be placed on the setting up appropriate National Science and Technology mation System. This should cover both biblio and technical information required for scientific as well as an integrated data-base for de making and policy formulation in the field of

17.116 A comprehensive and appropriate S National Information System would need to be ved through the joint efforts of the Departm Electronics, DST, CSIR, Department of En ment, Defence Research and Development Or tion, ICAR, ICMR, Controller General of P DGTD and various other organisations con with specific data-base areas.

17.117 The present library community also to be exposed to the concept of computers and usage, and the library training courses have to b larged to include computer application aspect Seventh Plan proposes to initiate the computer of most major libraries.

S&T and Productivity

17.118 Productivity depends on several actors besides available technology : management; availability, quality and reliability of inputs; incentives; labour efficiency; training and skills, etc. Efforts to increase productivity must be based on an integrated consideration of all these factors. Productivity is important not only in agriculture, industry and infrastructural areas of energy, transportation; etc., but in all aspects of national endeavour, including (and particularly in) administration and decision-making. Apart from productivity, it is necessary to ensure product quality. At present the capital-output ratio in Indian industry is very high and needs to be brought down. There is also inadequate attention to quality. Imports of technology and/or machinery that can be clearly identified with enhanced productivity or improved quality would be considered favourably. It would be incumbent on public financing institutions to support changes in equipment and technology for enhanced productivity, and also for companies to report productivity and energy use figures in their Annual Reports. Criteria will be evolved for measurement of productivity, and industry-wise productivity norms established. A major effort in the Seventh Plan would be to identify performance criteria for all the important sectors of the economy and lay these down explicitly, so that systematic and regular monitoring (concerning improvements in productivity) can be carried out.

S&T and Employment

17.119 Regarding S & T and Employment opportunities, two aspects need consideration : (a) the manner in which employment opportunities could be increased for qualified S & T personnel; and (b) the manner in which S & T could be utilised to increase employment opportunities in the country in general.

17.120 India today has a large stock of scientific and technical manpower, of just under three million. This would appear to be a large figure at first sight, but as a proportion of the total population it does not compare favourably with that in advanced countries or even in some other developing countries. Therefore, for a meaningful development of S & T and its application, there is need to increase the numbers of S & T personnel, ensuring at the same time that their quality and training is appropriate for the S & T tasks on which they would have to be deployed. At present, there is wide variation in the quality of S & T personnel emerging from the educational system, and a serious lack of coordination between manpower requirements (in terms of areas, numbers and levels of training) and the actual training of personnel. This has led, on the one hand, to serious shortages of qualified and trained manpower in many areas and, on the other, to the diversion of a large part of the S & T manpower to activities that can not be construed as scientific and/or technical. This position clearly needs to be remedied, and a start will be made in the Seventh Plan.

Enhancement of Employment Opportunities for existing S&T Personnel

17.121 With regard to already existing S & T personnel, and those that will emerge from the educational system until the measures now planned begin to take effect several measures initiated during the Sixth Plan period will have to be intensified. A National Science and Technology Entrepreneurship Development Board (NSTEDB) has been set up with the specific aim of improving the entrepreneurial capabilities of S&T personnel and generating schemes for self-employment in the S&T sector.

Increase in Employment Opportunities through S & T

17.122 With regard to the creation of significant employment opportunities in the country, clearly these will have to be related to agriculture and rural development. In agriculture, there are significant opportunities for enhancing employment through the extension of new agricultural technologies to low productivity regions and to small farmers. With S&T inputs major developments are possible in horticulture, fisheries, piggeries, poultry and animal husbandry, sericulture and post-harvest technologies. Again, S&T inputs leading to enhancement of rural energy supply through renewable sources of energy will create opportunities for cottage and village industries and home technologies and expansion of off-farm employment in agro-based rural industries and services. The Technology Policy adopted by the Government in 1983 states : "In all sectors, the potential impact on employment will be an important criterion in the choice of technology." This will be kept in mind to ensure that only technology and automation appropriate in the Indian context is introduced. The related objectives may be spelled out as follows : the effective use of what would otherwise have been regarded as wastelands and waste materials; the development of products and processes which increase the productivity of farm workers, artisans and industrial workers, hereby increasing their incomes and purchasing power; and the creation of productive and durable assets through S&T activities oriented towards beneficiaries, such as IRDP, NREP, etc. S&T can play an important role in enhancing employment, in making better use of available human resources, and creating national assets. This would call for a detailed analysis of the S&T component in each of

these areas involved.

S&T Defence and Civilian Sectors' Interface

17.123 Outlays on defence are included in the non-Plan sector. A large volume of items needed for defence are produced in Departmental and Public Sector undertakings (PSUs) under the Ministry of Defence as well as through civilian industry; there is a very considerable amount of science and technology associated with this production. Many sophisticated items are imported and significant S&T is involved in their use, maintenance and licensed production. A large chain of laboratories under the Defence Research and Development Organisation (DRDO), has now grown to maturity in the 25 years of its existence. There is great strength and competence in these laboratories over a wide range of disciplines in science and technology. This S&T infrastructure and capabilities, built up in relation to the defence needs, must be regarded as an integral component of the S&T capabilities of the country.

17.124 Defence PSUs present us with a challenge and an opportunity. The challenge is to make them flexible both technologically and managerially so that they can meet some of the demands of the civilian sector; the opportunity is in curbing excessive dependence on manufacturing units outside the country.

17.125 In defence, considerations of quality and reliability are paramount. But there is another compelling reason for a link-up between the civilian and defence needs. This arises out of the quick obsolescence inherent in military equipment. Numbers are not helpful either, as force-multiplier effects of new weapons will be telling. There is thus a continuing necessity to develop new weapon systems and update the available ones to stretch them a little further. Such capabilities, arising through the imperatives in the defence sector, can be of great importance for the development of new technologies and capabilities in the very large civilian sector.

17.126 The Defence Research and Development Organisation (DRDO) has grown into a group of efficient laboratories already engaged in the design and development of aircraft, missiles, tanks, armaments and a variety of electronic equipment systems. To develop these designs further, and to engineer and to execute these designs, the expertise and infrastructure of other engineering units in the country is needed, apart from that of the defence production units.

17.127 There are more than forty defence laboratories, and some of these are only national repositories in some specific areas of technology. Their competence and experience must be available to other areas of national endeavour so that the available skilled manpower and high-cost infrastructure is fitably used. Signs of these are already visible, more needs to be done in an organised way.

Management and Administration of Scientific I tutions

17.128 Success in scientific endeavour depe significantly on imaginative and flexible systems management and administration, which will help realisation of the full potential of the gifted, tra and highly valuable manpower resource, and en conditions for the highest level of performanc achieving the objectives that are laid down. It is perative to have a dynamic and sensitive man ment, and appropriate working conditions and in tives which will attract, retain and deploy in a pate efficient manner these precious human resource

17.129 Scientists and technologists in scientific titutions perform their best under good leaders when the challenges posed are clear and exciting, achievements are regularly recognised and rewar

17.130 There is every need now to make ca in Science and Technology highly attractive, exc and rewarding. Excellence can be fostered only w there is competition and selection. Mobility there must be positively encouraged.

Science as a Rewarding Career

17.131 *Recruitment* : To attract the bright and motivated to research, care should be taken to en a career for them so that they are not at a disad tage vis-a-vis other career opportunities likely to available to them. At present, except for autonom agencies like CSIR, ICAR, ICMR, Universities autonomous institutes, and specialised Governm departments like Atomic Energy, Space, Electro DRDO and CASE, all other recruitment to scien departments|institutions is carried out thro UPSC|State Public Service Commissions. There i rationale behind keeping some of the recruitm within this system, while a large part of it lies outs Recruitment and promotions in the case of scien and technical posts call for speed, flexibility an close appreciation of the needs and objectives. recruitment procedures outside of the UPSC PSC will need to be adopted for recruitment scientific institutions.

17.132 *Advancement* : *In situ* promotion by assessment should be introduced wherever it is ing. Flexible complementing has been or is introduced in scientific departments and Agen This should be implemented uniformly, and applicable in appropriate form to the case of ciated administrative staff, since ultimately the institution has to function as a team.

17.133 The highest grades available in Government should be available to scientists working on scientific tasks. Special attention should be paid to the university system to see that proper career opportunities exist right from the point of entry, and outstanding scientists are on par in respect of opportunities, remuneration and prospects with corresponding personnel in national laboratories. Better salary structures are called for than are available at present.

17.134 In fact what is important is not the scale and gross pay received, but the net or take-home pay. It should at least be ensured that the quality of life at corresponding levels is comparable to what obtained at the time of Independence.

17.135 *Retirement* : The age of retirement for scientists should be made uniformly 60 years.

17.136 *Nurturing young scientists* : Scientists should be provided with challenges and given necessary resources at an early age so that they have an opportunity to satisfy their scientific creativity and ambitions, such incentives would raise considerably their performance levels and would ensure their advancement as well as groom them for leadership. The task of identifying promising young scientists and nurturing them should receive high priority. This would include provision of research facilities, administrative back-up as well as support for travel and participation in scientific meetings and symposia in the country and abroad. These should be available on a direct basis rather than through a hierarchical reporting system.

17.137 *Incentives and awards* : Performance should be constantly reviewed against announced objectives. This should be done on a peer-review basis. There is very special need for recognition of contributions to the development and improvement of technology, and for success in transfer of technology.

17.138 *Mobility* : More than ever before, a rewarding career in science requires easy transfer between institutions. Technology development and application can be truly realised only when S&T personnel move, with minimum discomfort and disadvantage, to new positions, locations and institutions, carrying with them know-how and know-why, knowledge and skills. Conditions today discourage and indeed preclude mobility. There is urgent need to facilitate mobility by removing related disincentives. Rules should be such that terminal benefits, leave etc. can be moved alongwith the individual. Systems for scientists and technologists to hold concurrent positions in research institutions|universities|government|industry should be introduced.

17.139 *Facilities for scientists* : The most pressing need is housing. Without assured housing, recruitment of fresh talent and also mobility is becoming increasingly difficult. Institutions should be allowed to deploy the total resources allocated in such a manner that housing needs are met, as fulfilment of assigned tasks will demand not only operational buildings, equipment, salaries of staff and revenue budgets, but also assured housing.

17.140 Provisions for sabbatical leave, liberal study leave and other measures are very necessary to enable scientists to improve their professional competence.

Mechanisms for Utilisation of Scientists of Indian Origin Working Abroad

17.141 In recent years the number of Indian scientitsts, technologists, engineers, doctors, etc. working outside the country has increased. However, it has been found that they have continuing commitments to India's development. They have shown interest in working on several vital research and development areas in India. In order to bring them back, on short or long tenures, appropriate mechanisms would need to be evolved. These can include lecture assignments, consultancy in industry and assistance in setting up pilot projects in India. The areas of biotechnology, micro-electronics, informatics, etc. offer significant potential. For this, there will be need for new approaches and more flexible administrative procedures.

Management System

17.142 In view of the large number of S&T institutions, laboratories, etc. in the country and their charter, objectives and constitutions, it is recognised that one uniform management structure will not be suitable for all these institutions. It is necessary to ensure that all S&T institutions have real and meaningful autonomy, and should be characterised by pursuit of excellence and functioning of a scientific culture. There should be involvement of scientists at all levels in decision making processes as a scientific culture is characterised by a non-hierarchical approach.

17.143 *Planning and implementation of research* : Each institution should have clearly defined objectives and goals, having regard to its charter, and such missions as may be assigned to it. It should be acknowledged that all research may not lead to generation of new know-how; even access to new knowledge should be considered adequate pay-off. All institutions should adapt advanced planning strategies, keeping in mind these features.

17.144 Alongwith projectisation of as much of the total activity of the institution as possible, project funding should be substantially enlarged, and an appropriate strategy for project management should be developed.

17.145 Management information system : All S&T

institutions should have a Management Information System (MIS) so that the total scientific effort in the institution is suitably reflected; standard UNESCO classifications may be used for this. The MIS should reflect the periodic progress in achieving objectives and should also provide for closure of a project on review, if necessary, development of strategy and direction, and redeployment of total resources, both human and physical. A nationally integrated MIS on projects, resources available, expertise etc. should be developed so as to achieve optimal utilisation of human and other resources.

17.146 Training : Training and re-training of personnel, as well as mobility, should be built into the management culture of all institutes and organisations.

17.147 Office Management : Office management should be modernised by the replacement of conventional methods with modern equipment. The capabilities that are available through recent developments in informatics should be fully assimilated.

NATIONAL SCIENCE PRESS

17.148 In order to have scientific journals, publications, pamphlets, etc. printed expeditiously, on the most modern lines there is a need to establish a central processing unit linked with a high-power computer in the country. Such a facility would help in standardisation of the format of scientific periodicals and provide total control on printed information in machine-readable form.

Culture

17.149 Investments in S&T can become truly effective only if adequate attention is paid to the development of human resources and to systems for their effective functioning. Major changes can be brought about rapidly by careful planning, and training for such changes and monitoring these.

International Collaboration in Science and Technology

17.150 The growth of science and technology in the recent past has been truly phenomenal. These new developments are not only of fundamental scientific significance but have great potential for application. Some of these should enable developing countries like India to accelerate the pace of their progress. It is important therefore to keep abreast, and to develop awareness and understanding about these developments, as also to initiate work in selected areas that hold great promise for scientific development and for applications. International collaboration constitutes an important means for accomplishing this at lower costs and in shorter time-frames.

17.151 India has thus strongly supported i national collaboration for meeting its own n There is, however, another equally important as We have considered it our responsibility to s our knowledge and experience, and some of infrastructure and training facilities, with other tions that would benefit from it.

17.152 Whether in collaboration with scientifi advanced or other developing countries, we have garded international collaboration as something w should be based on trust and mutuality, invol meaningful participation of all those working gether, with sharing of benefits and generaion understanding and friendship. Additionally, it be ensured that our activities do in the field of national collaboration conform to the objectives have set for ourselves, and do not distort our nati priorities, values and approaches.

17.153 Future international collaboration in should take note of the levels of excellence and c bilities reached in India in different sectors. Suc strategy would demand fuller coordination betw different S&T agencies as well as users of S&T. comprehensive information system on internati collaboration has to be created. Adequate inv ments should be made nationally for physical fa ties and for training programmes to enable us make meaningful use of scientists from abroad work jointly in desired directions. Programmes make optimal use of foreign technical assistance av able through bilateral or multilateral coopera arrangements, should mesh with national priori as outlined in the Plan document. The mechani to implement international collaboration in S would be through bilateral and multilateral coope tion and Technical Cooperation among Develop Countries (TCDC).

17.154 The objectives, priorities and thrust ar as identified through the planning process in country should be fully recognised, e.g., in the f mulation of the UNDP Country Programme meaningful utilisation of foreign technical assis

National Data Base

17.155 An integrated information system has be instituted to cover data of all types relating bilateral as well as multilateral cooperation in S

National Effort

17.156 The international cooperation program should make a definite contribution to S&T devel ment in India, and should be increasingly evaluat for their relevance to the planned development pr cesses.

MAJOR PROGRAMMES OF SCIENTIFIC AGENCIES/DEPARTMENTS

Atomic Energy

17.157 The Indian atomic energy programme was launched mainly to meet the long-term power needs of the country, particularly of regions located at great distances from the main coal-bearing areas and to utilise nuclear techniques in agriculture, industry, medicine and other areas. The programme is based on the significant availability of uranium for the first phase of the programme and of abundant thorium resources for the later part. In view of the strategic nature of this area and the need to avoid vulnerability, the programme has been taken up on a highly self-reliant basis from the outset, hence the added stress on research and development.

17.158 The Seventh Plan proposals for the R&D sector of the Department of Atomic Energy include the programmes of BARC, VEC, CAT, RRC, AMD, TIFR, SINP, TMC and Institute of Physics (Bhubaneshwar) and also grants-in-aid and housing.

17.159 *Bhabha Atomic Research Centre (BARC)* : The new high-flux 100-MW indigenous reactor DHRUVA is expected to go into operation soon. The reprocessing plant has been recommissioned at Trombay. Research and Development in support of the 500-MW stations is underway. New facilities for research in nuclear sciences include the Variable Energy Cyclotron, the Pelletron accelerator, (both constituting national nuclear facilities) and the electron accelerator for chemical research. Mixed oxide fuel has been developed on a laboratory scale, and design of the processes and equipment for large-scale production have been completed. This development can be of great significance for light-water power reactors. Plutonium carbide fuel for the Fast Breeder Test Reactor (FBTR) is under production. The Radiation Medicine Centre has enlarged the scope of nuclear medicine in the country. The number of isotope users in industry and medicine has increased.

17.160 The R&D proposals of BARC fall under the broad areas of physical, computer, chemical and life sciences, nuclear materials, nuclear fuels, nuclear operations, reactor engineering and safety research, production and applications of radio isotopes, and instrumentation.

17.161 Facilities will be created for the development and testing of power reactor components and equipments, including fuelling machines, and for generating basic data for thermal hydraulics and safety analysis. Research will be carried out on the modernisation of reactor control instruments and on the development of CAMAC and FAST BUS INSTRUMENTS. A number of R&D programmes will be pursued for the finalisation of the 500-MWe pressurised heavy water reactor as part of the nuclear power programme. Engineering facilities would be set up in DHRUVA for testing of prototype fuel elements for power reactors. In the area of heavy-water production, test facilities would be set up for a better understanding of the existing processes and for developing new processes. In the area of isotope technology, a whole new range of agro-chemicals, radio-tracers and radio-pharmaceuticals will be developed. An in-house cyclotron will be set up for the development and production of short-lived and positron-emitting radio nucleides with applications in medicine.

17.162 In the area of basic research, the DHRUVA (reactor) and Pelletron (accelerator) facilities will be used for carrying out research in physical and chemical sciences. Research would be carried out on isotope-based aspects in agricultural productivity, and refinement of techniques for diagnosis and control of diseases. Work in biotechnology and enzyme engineering, where a good base has been created, will continue.

17.163 *Variable Energy Cyclotron (VEC)* : At this national facility, it is proposed to enhance the computational system so as to make it usable for on-line data acquisition in tandem with the machine. With the addition of a heavy-ion-source external injection system, the scope of the machine is being widened for undertaking work in the field of heavy ion physics.

17.164 *Centre for Advanced Technology (CAT)* : A new Centre, based on the expertise and experience of BARC, but independent of it in terms of infrastructural support, has been initiated at Indore. The new Centre will concentrate on comprehensive development of expertise in all types of lasers and laser applications, especially of the high-powered, pulsed-variety fusion technologies, and also, accelerator technology of both linear and ring-type machines, capable of producing particle beams in the GeV range for spallation breeding. High technology research would include multi-beam laser fusion experiments and work on plasma focussing devices and pinches. The Centre will generate many supporting technologies such as high voltage pulse technology, r.f. technology, ion source technology, rapid cycling magnet technology, cryogenics and ultra-high vacuum technology, etc. Synchrotron Radiation Source (SRS) would be set up as a national facility.

17.165 *Reactor Research Centre (RRC)* : RRC at Kalpakkam has been set up with the primary aim of developing capabilities for the design, construction and operation of fast breeder power reactors with indigenous technological resources. The Fast Breeder Test Reactor (FBTR), which is the first

step in the programme, would be in operation soon. Work would be initiated on the 500-MWe prototye fast breeder reactor to be commissioned in the mid-90s. For this purpose, sodium technology related to fast reactors is being developed. Facilities will be created for post-irradiation examination of fuels and materials irradiated in FBTR. R&D work will be carried out for specifying and developing materials with improved properties for future fast reactor use and for understanding the physics of defects in materials which has a bearing on the phenomenon of radiation damage. Investigations will be carried out on the reprocessing and waste management aspects relevant to fast-reactor fuels. Detailed characterisation of sodium and fuel materials will be carried out. R&D will also be aimed at safety analysis of fast-reactor operations.

17.166 *Atomic Minerals Division (AMD)* : As a result of exploration carried out in the past, AMD has identified extensive areas of igneous metamorphic and sedimentary formations in different parts of the shield areas and the Himalayas, which require detailed evaluation. The activities of AMD will continue to be channelised towards not only increasing the inventory of uranium reserves but also augmenting the infrastructure and R&D facilities for farther intensive exploration.

17.167 *Tata Institute of Fundamental Research (TIFR)* : The major outlay is for supporting new research programmes at the frontiers of astronomy and astrophysics, cosmic rays, gravitation high energy physics, condensed matter and semi-conductor-physics, chemical physics, molecular biology, computer science and speech research, development of equipment for pelletron-based nuclear physics programmes, etc.

17.168 *Tata Memorial Centre (TMC)* : TMC has proposed to expand its existing programme by setting up a new Centre. The thrust would be towards organisation of a bone marrow transplant unit, establishment of a division of laboratory medicine, newer radiation therapy, techniques, etc. In addition, the facilities at the Cancer Research Institute would be augmented and strengthened for undertaking R&D work in the emerging field of biotechnology, particularly relating to molecular genetics, viral oncogenesis and hybridomas.

17.169 *Saha Institute of Nuclear Physics (SINP)*: The proposals include setting up of an electron microscope facility and research in the areas of theoretical and experimental nuclear physics, hot plasma, and atomic and molecular chemistry.

17.170 *Institute of Physics, Bhubaneshwar* : The areas of work proposed include setting of an electron accelerator and research in atomic physics, nuclear physics, solid state physics and material sciences.

17.171 National Programmes : Giant Me Wavelength Radio Telescope (GMRT) identified the Steering Group on Science and Technology, be set up as a national facility.

17.172 A National Centre for analytical chara risation of high-purity materials will also be set as a national facility.

17.173 In addition, two programmes of a gene national character will be initiated under the auspi of DAE. These are : (a) Fundamental research biological sciences, and (b) Homi Bhabha Cen for Science Education.

Space Science and Technology

17.174 The thrust of the Indian space progra me has been to develop skills and capabilities to d sign and build satellites and satellite launch vehicle to define areas of application such as telecommun cation, broadcasting and remote sensing, and to d sign and fabricate instrumentation for such applic tions; and to commission and utilise operational ap plication systems to ensure the benefits of space sc ence and technology for the socio-economic dev lopment of the nation. The Indian space program mes are directed towards the goal of achieving self reliance in the use of space technology for nationa development. The programme of the Indian Spac Research Organisation (ISRO) is executed throug the eight centres|units namely Vikram Sarabhai Space Centre (VSSC), Trivandrum; Space Applications Centre (SAC), Ahmedabad; ISRO Satellite Centre (ISAC), Bangalore; Sriharikota Ranges (SHAR), Sriharikota; Auxiliary Propulsion System Unit (APSU), Bangalore and Trivandrum; Development and Educational Communication Unit (DECU), Ahmedabad; National Remote Sensing Agency (NRSA), Hyderabad; and Physical Research Laboratory (PRL), Ahmedabad.

17.175 *Space Profile* (1980—90) : The major missions|objectives envisaged in the approved space profile for the decade 1980—90 are : to develop and launch an Indian Remote Sensing Satellite (IRS) for effective utilisation of remote sensing technology and to promote the establishment of national resources survey and management system; to improve the technology and the payload and orbital capabilities of the SLV-3 (launch vehicle) through the development of variants (ASLV|PSLV) for enhanced application; to acquire ability to launch satellites to geo-synchronous orbit; applications in communication, meteorology etc., to accelerate the indigenisation of the space segment of the INSAT system and replace the space segment by an Indian-built satellite; and to enhance the capabilities of ISRO Telemetry Tracking

and Telecommunication network (ISTRAC) as well as the national test and launching ranges required to meet the space programmes outlined above. The investments relate both to the project expenditure as well as various supporting facilities required, e.g., propellant production, tracking networks, space qualification and testing equipment, etc.

17.176 *Seventh Plan—Thrusts* : Space activities carried out during the last two decades have reached a stage where investments made in Research and Development are beginning to fructify in terms of the ability to establish national operational space services for meeting the objectives laid down. The main thrust in the Seventh Plan will be to make the satellite-based domestic broadcasting, communications and remote sensing operatonal, based largely on indigenous satellite and launch systems. Significant progress will be made in interlocking the various segments of the national space effort, by completing the linkages between the launch vehicle, spacecraft, application and utilisation programmes. Reducing external dependence and rapid development of Indian launch vehicles for operational satellites are integral to these objectives. Concomitant organisational and infrastructural changes would be implemented.

17.177 *Programmes* : Three indigenous spacecraft series are required for providing the operational services expected from the Space Programme on a continued basis : (i) 150-kg-class satellite series for low-earth missions in science|technology applications (SROSS); (ii) 1000-kg-class polar-orbiting remote sensing satellite (IRS); and (iii) successive geostationary spacecraft for broadcasting, communications and meteorology for continuation and further development of the Indian National Satellite (INSAT) system. The corresponding three indigenous launch vehicles for these satellites are to be developed and made operational. The first combination (SROSS|ASLV), will be made operational during the Seventh Plan with a flight every 1 to 1-1|4 years. One IRS launch is targeted every 2 to 2-1|2 years from 1986 to sustain the resources management system. From 1988 onwards spacecraft will be launched by the indigenous PSLV launchers.

17.178 The first launch of an indigenous proto-INSAT|INSAT-2 test spacecraft is targeted for 1988 and the second for 1990. Every attempt will be made during the Seventh Plan to ensure that subsequent INSAT-2 operational missions would be launched by the Indian Geosynchronous Launch Vehicle (GSLV), after completing its development and first flight test in 1990|91. The optimal configurations for indigenous INSAT spacecraft and GSLV are currently being defined. The INSAT-2 test spacecraft development had begun before the close of the Sixth Plan, while the cryogenic engine systems for converting the PSLV t the geosynchronous launcher are planned for th Seventh Plan period.

17.179 The major efforts of all ISRO|DOS Centre and Units would be oriented towards realising thes mission targets.

17.180 Pre-investment R&D for the missions of th Eighth Plan, and advanced R&D for the perio beyond will be energised with defined priorities.

17.181 *Linkages* : The significant outlays for th on-going and new projects would call for a new phas in strengthening the linkages between the space pro gramme and Indian industry, even as progress in ope rational national services in broadcasting, communica tions and remote sensing interlink the space effort with a growing number of other national user sectors The space programme has already catalysed thes linkages; it must now maintain the tempo by sustain ing the space services and meeting the growing expec tations it has generated.

17.182 Major complementary investments hav already been made for utilisation of satellite-base communications, TV and radio broadcasting and me teorological services by various national agencies.

17.183 A National Natural Resources Managemen System (NNRMS) is being evolved. A national net work of five regional centres and a few utilisatio cells will be established as a part of IRS utilisatio programme. Utilisation of satellite-based remote-sens ed data would be a crucial element of NNRMS. Assis tance will be provided to various State Government to develop the applications and utilisation of remote sensed data.

Ocean development

17.184 The Department of Ocean Developmen (DOD) was created in 1981 and the Seventh Pla will be the first full plan of the department.

17.185 Ocean development programme for th Seventh Plan would focus attention on :

(i) Scientific research in Antarctica;
(ii) Coastal zone research;
(iii) Polymetallic nodules programme; and
(iv) Development of human resources.

Salient features of the above programmes are briefl described below.

17.186 *Antarctic Programme* : India has accede to the Antarctic Treaty, which will be coming up fo review in 1991. It is necessary that by then India ha two well-established, permanently-manned stations i Antarctica, to obtain detailed knowledge relating t the various aspects of the Antarctic resources and cl matic aspects; organisation of expeditions; running o research stations; operation of research and suppl vessels; and participation in international research an information dissemination efforts. Many Indian insti

tutions, including universities, national laboratories the Indian Navy and various Government agencies are participating in this programme. It is proposed to establish an autonomous Antarctic Research Centre (in India) to take full responsibility for the programme. Five more expeditions to the Antarctic would be undertaken, one during each year of the Plan. It is also proposed to commission an ice-breaker vessel.

17.187 *Coastal Research Programme* : The principal goal of coastal management is to recover or preserve resources of value in the offshore area without increasing the burden of natural and man-made stress to a point where either the physical environment or its users suffer serious loss. The following research programmes are proposed :

(a) Bathymetric surveys; measurement of currents; waves and tides;
(b) Study of erosion and accretion problems;
(c) Harbour protection and development; and
(d) Environmental monitoring along the coasts and estuaries.

17.188 Coastal Research Vessels (CRV) are proposed to be acquired and this programme would be undertaken in consultation with DOEn, Coast Guard, Fisheries Research Institutes, ONGC, IMD, the Navy and the island administrations.

17.189 *Marine Environment Programme* : A network of stations, for monitoring pollution, weather and ocean parameters along the Indian coast and offshore areas, are proposed to be established in collaboration with a number of other organisations, *viz.*, DOEn, Universities, NIO,ONGC, Coast Guard, the Navy and IMD.

17.190 *Polymetallic Nodules Programmes* : With the status of pioneer investor, India is poised for a major programme in deep-sea mining. Extensive surveys have been carried out in the central Indian ocean to identify sites for mining. Commercial mining of the nodules in the mid-nineties appears to be a possibility. Further survey and assessment work will be done, and technologies for mining and processing developed through pilot plants after examining all possibilities.

17.191 *Survey and assessment of resources* : India has in its jurisdiction approximately 2 million sq km of sea areas as its Exclusive Economic Zone. A gross assessment of both living and non-living resources would be made all over the zone, with some detailed surveys in specific areas in the deep sea, which would appear to be most attractive for exploitation. This programme will be implemented under contract from the DOD by organisations such as National Institute of Oceanography (NIO), Naval Hydrographic Office (NHO), Geological Survey of India (GSI), Indian Council of Agricultural Research (ICAR) etc.

17.192 *Human resources development* : In order to generate the manpower needed for work in this area and improve the quality of higher education, a number of steps are proposed to be taken, including special courses in marine sciences, strengthening of facilities relating to oceanography at various academic centres, creation of centres of excellence in various areas of oceanography, etc. These would be formulated and implemented in consultation with the UGC.

17.193 *Promotion of basic research* : To augment and improve our knowledge of marine environment, basic studies would be carried out in marine biology, physical and chemical oceanography, marine geology and geophysics, palaeontology and others. Some programmes on the development of marine technologies would also be initiated in joint consultation with the Ministry of Defence including DRDO, the shipyards, etc.

17.194 *Marine instrumentation, calibration and testing facilities* : It is proposed to develop facilities for design, development and maintenance of marine instruments and set up calibration and testing laboratories.

17.195 *Development of underwater technology* : This programme relating to submersibles will be undertaken under the overall supervision of DOD and will be executed under contract by agencies like IIT (Madras), Hindustan Shipyard Ltd., Mazagaon Docks, Naval, Science and Technology Laboratory (NSTL) and Bharat Heavy Plates and Vessels Limited (BHPV).

17.196 *Contract with industry* : Engineering, electronics, chemical and other industries will be identified and these industries will be given development contracts by DOD to design and manufacture critical systems and components for marine programmes.

17.197 *All-India coordinated programmes* : A few programmes have to be designed specifically as inter-institutional marine technology development projects like : (i) remote sensing of oceanographic paramaters (NIO, NNRMS), (ii) telemetry data buoy systems (DOD, IMD and ISRO), (iii) oceanographic towers (DOD, IMD, ONGC and the Port Trust), and (iv) underwater navigation system (NIO, NPOL & NSTL).

17.198 The economics, management, legal and organisational aspects of implementing several programmes for the development and utilisation of marine technology would have to be worked out. It is proposed to start an All India Coordinated Programme in ocean management which will encompass these fields.

17.199 *Development of ocean data base* : The National Oceanographic Data Centre, now located at NIO, would be upgraded and made into an autonomous centre under DOD to acquire, process, dissemi-

ment, store, retrieve and disseminate data and information on the most advanced lines.

17.200 *Other programmes* : In addition, programmes on Ocean Thermal Energy Conversion (OTEC), Wave Energy, and production of Marine Chemicals, Drugs and Food from the Sea would be undertaken on a pilot basis. Survey of marine living resources along the coasts and screening and chemical investigations of marine algae would also be taken up.

Science and Technology

17.201 The Department of Science and Technology (DST) is primarily concerned with the promotion of carefully identified new and emerging areas of science and technology, and coordination of multi-institutional and interdisciplinary activities in areas of national relevance.

17.202 The SACC Secretariat is located in the Department. DST also provides secretarial support and implementing mechanisms for activities of National Biotechnology Board (NBTB), National Science and Technology Entrepreneurship Development Board (NSTEDB) and National Council for Science and Technology Communication (NCSTC).

17.203 The Department supports a number of autonomous research institutions as part of its grant-in-aid programme, and major survey organisations like Survey of India (SOI) and National Atlas and Thematic Mapping Organisation (NATMO).

17.204 Recently the India Meteorological Department and three institutions, namely Indian Institute of Tropical Meteorology, Indian Institute of Geomagnetism and Indian Institute of Astrophysics, have been transferred from the Department of Civil Aviation to DST. On the other hand, the schemes relating to technology utilisation, National Information System on Science and Technology (NISSAT) and the work of the two public sector undertakings, namely, Central Electronics Limited (CEL) and National Research and Development Corporation (NRDC) have been transferred to the newly created Department of Scientific and Industrial Research (DSIR).

17.205 The efforts initiated in the Sixth Plan for identifying thrust areas, and supporting programmes in frontline areas in various disciplines, will be strengthened and consolidated, so that excellence in selected fields in science would be nurtured on a selective basis. In doing so, linkages with other scientific agencies, national laboratories, public and private sector undertakings and user and beneficiary elements would be established. Major facilities would be created wherever necessary.

17.206 Special efforts would be made to ensure that a larger number of the scientific community in educational and research institutions are provided opportunities for frontline areas of research, sop ticated instruments and research facilities will set up through inter-agency mechanisms at the na nal level which will be available to all users.

17.207 *Science promotion programmes* : science promotion programme will also give emph to science and society-related activities, e.g., invo ment of young scientists, women scientists, ret scientists, SC|ST, weaker sections etc. Special phasis will be laid on application of S&T for r development programmes.

17.208 Under the R&D schemes, efforts would made to consolidate the activities of Science Engineering Research Council (SERC). Several units are proposed to be set up in thrust areas atomic collisions, material characterisation, X- crystallography, laser spectroscopy, through Inte fication of Research in High Priority Areas (IRHP It is proposed to set up a phytotron as a natio facility.

17.209 The activities of Regional Sophistica Instrumentation Centres (RSIC) would be furt intensified for optimum utilisation of the equipm in the existing centres. The science promotion p gramme will continue to be based on the princip enunciated in the Scientific Policy Resolution (SP

17.210 Increased emphasis would be given to implementation of the Technology Policy Statem (TPS).

17.211 *Sectoral Programmes* : While promot new areas in science and technology, sectoral p grammes would be taken up in the areas of ea sciences which will include meteorological resear arid and semi-arid zone research, etc.

17.212 Major programmes are also to be launch in atmospheric sciences and natural disaster studi especially in the fields of weather prediction a atmospheric modelling, cloud physics, atmosphe boundary layer studies, radiation studies, cyclone search, weather modification research, etc. The programmes will be executed by a large number concerned groups and institutions in the country a coordinated by DST.

17.213. In view of the national importance attac ed to the question of manpower development in t areas of science and technology, and to work wards a matching of educational planning with i vestments being made in S&T system and its corre ponding personnel needs, the Department plans build up an information base through comprehensi surveys.

17.214 Since not much emphasis was given to e gineering sciences in the Sixth Plan, it would taken up as a major activity in the Seventh Plan. Th effort would be to establish a firm R&D base in e gineering sciences to meet the requirements of va

ous economic sectors as well as to carry out research in frontline areas relevant to future technologies.

17.215 Based on activities initiated and progressed during the Sixth Plan, the Department proposes to undertake major national programmes relating to an appropriate management information system, and to establishing the programme of national coordination of testing and calibration facilities.

17.216 As part of the technology development projects, concerted efforts would also be made in areas connected with new fibres and composites, ceramics, cryogenics, etc.

17.217 *S&T entrepreneurship* : The National Science and Technology Entrepreneurship Development Board, set up during the Sixth Five Year Plan, has evolved specific major programmes for implementation. These relate to : the setting up of S&T entrepreneurship Parks (STEP); undertaking programmes for entrepreneurial development; programmes connected with information dissemination; development of S&T based self-employment schemes, etc.

17.218 *S&T communication* : The National Council for S&T Communication was set up during the Sixth Plan for formulation of a national plan for popularisation of science and technology and development of the scientific temper. Emphasis will be given to specific action plans such as : training of S&T communicators; setting up of appropriate infrastructures for diffusion and dissemination of S&T information connected with the popularisation programme, e.g., National S&T Information Bureau; support for voluntary organisations working on these problems; programmes to make full use of modern electronic techniques (radio, TV, VCR|VTR etc.); orchestration and coordination of programmes in this area being undertaken by various agencies; etc.

17.219 *Biotechnology* : A national programme in the emerging area of biotechnology had been initiated. The National Biotechnology Board (NBTB) was set up during the Sixth Plan, as an apex coordinating body, to identify, coordinate and oversee priority areas of development in this field, to build up required manpower and infrastructural facilities, and to arrange for integrated industrial development and large-scale use of high technology products and processes based on the multidisciplinary areas of biotechnology. For the Seventh Plan, emphasis under the auspices of the NBTB will be given to programmes connected with : manpower development; initiation of new projects and programmes involving multidisciplinary and multi-institutional participation, together with necessary linkages with industry, involving-techno-economic feasibility studies; providing seed and risk capital in establishing large-scale applications using technologies developed within the country; and setting up manufacture (and associated R&D) of products based on modern biotechnolog The necessary infrastructure like germ plasma bank pilot plant and other bio-engineering scale-up facil ties, network of biotechnology information system animal house facilities, etc. would also be set up In addition, production and manufacturing units fo vaccine against major diseases, and production o plasma, serum, hormones and enzymes would b taken up. It is expected that by 1990 some of th major vaccines needed for the Expanded Programme of Immunization would be produced indigenously o a large-scale, using modern techniques.

17.220 *International S&T cooperation* : Under th international S&T cooperation programmes, activitie connected with the setting up of a Centre for Scienc and Technology for Non-aligned Countries which were initiated during the Sixth Plan are expected to become operational. Programmes connected with Technical Cooperation among Developing Countries will also be strengthened.

17.221 The DST will continue to play a coordinating role for science and technology matters within the UN system. In addition, an International Centre for Genetic Engineering and Biotechnology (ICGEB) and an Indo-French Centre for promotion of advanced R&D would be set up. Efforts would be made to strengthen the offices of the science counsellors located in various countries.

17.222 *Scientific surveys* : Activities of the Survey of India and the National Atlas and Thematic Mapping Organisation will be strengthened by introducing computerised information system, modern geodetic techniques and satellite geodesy in the survey activities of these organisations. The schemes devised under the Seventh Plan will lay strong emphasis on giving greater user satisfaction, in terms of demands for client-specific maps and their wider dissemination.

17.223 *S&T missions* : A special feature during the Seventh Plan would be the undertaking of S&T missions. The objective would be to accomplish specified tasks with high visibility. A significant S&T component should be involved in the fulfilment of these tasks. Such an approach will foster relevance, provide motivation and automatically establish organic linkages, which are live and working, between the concerned sectors. Organisational structures would be created for coordination, identification and monitoring of important S&T missions, on an inter-agency basis. It is also proposed to set up an Interministerial Mission Approval Board as a focal point for approvals, policy directions, monitoring and overall coordination. In the identified areas, interdisciplinary groups would be set up for preparing project documents.

17.224 Through the above-mentioned efforts, DST would continue to play the role of a coordinating department for promotion and advancement of science

and technology activities.

Meteorology

17.225 Activities in the field of Meteorology and Atmospheric Sciences and related areas are being carried out by the India Meteorological Department (IMD), and three autonomous Institutes, viz., Indian Institute of Astrophysics (IIA), Indian Institute of Tropical Meteorology (IITM) and Indian Institute of Geomagnetism (IIG).

17.226 The efforts in the area of meteorology by IMD and IITM during the Seventh Plan would seek to improve meteorological services provided to the users and beneficiaries and also to carry out research and development activities required to effect an improvement in the efficiency and accuracy of these services. IIA and IIG would continue to be engaged in research in the fields of astrophysics and geomagnetism.

17.227 *India Meteorological Department* : The major thrust of the department would be modernisation of facilities.

17.228 *Replacement of obsolete equipment* : With a view to increasing efficiency in providing meteorological services to sectors like agriculture, flood control, etc. it is proposed to replace some of the major equipments like radio theodolites, wind-finding-cum-weather radars, cyclone detection radars, X-band storm-detection high-pressure hydrogen generators, etc. In addition, some obsolete tele-communication equipment like VHF transreceivers, communication receivers, facsimile recorders, teleprinter machines, etc. would also have to be replaced.

17.229 *Improvement of forecast and cyclone warning system* : Forecasting services are to be improved to meet operational needs, through modernisation of the upper air network and radar network. It is proposed to instal modern aeronautical and meteorological instruments, a message-switching computer, RTT and facsimile facilities, wind-finding equipment and storm-detection radars in some of the major locations.

17.230 *Augmentation of computer facilities* : The existing computer in Delhi has practically completed its life expectancy. It is proposed to instal a high speed and highly versatile super computer system in the Northern Hemisphere Analysis Centre which would be functioning as a regional forecast centre for aviation purposes in South Asia, and also to execute some of the major programmes like IMAP, monsoon studies, world climate programme, etc. Since the thrust in the meteorology programme would be directed towards a 10-day medium-range weather forecast, an appropriately large computer system would be needed for developing a meteorology data bank at the global and national level, and for modelling computations.

17.231 *Improvement in surface and rainfall network* : A major attempt will be made to departmentalise as many observatories as practicable so that the information and data on surface and rainfall are realistic and dependable.

17.232 *Space meteorology* : To fully utilise INSAT-IB satellite, additional data collection platforms will be installed. Aircraft-to-satellite data relay system would be introduced. In addition, the disaster warning system would be strengthened. Facilities will be established for development of software for processing data from proto-INSAT.

17.233 *Agro-meteorological advisory service* : For improvement of agro-meteorological advisory services and advance weather warning system to the farmer, a committee has been constituted. The recommendation of this committee will be implemented through a mission-oriented approach by intensifying the existing schemes like agro-meteorology (computer modelling for medium-range weather forecasting), instrumentation and communications.

17.234 *Construction work* : It is proposed to provide a certain number of office/operational buildings and residential accommodation in some of the priority programmes.

17.235 In addition to the above thrust areas, 16 on-going schemes would be continued and three new schemes, viz., physical meteorology, antarctic meteorology, and international cooperation programmes would be initiated.

17.236 *Indian Institute of Astrophysics* : Four on-going schemes would be continued. The major thrust will be on maximum utilisation of the 234-cm telescope as a national facility.

17.237 *Indian Institute of Tropical Meteorology* : The major programme would be centerd on circulation and climate modelling, forecasting research, air-sea interaction studies, weather modification of cold clouds, radio-meteorology with emphasis on remote sensing, etc. It is also proposed to acquire a high-speed computer.

17.238 *Indian Institute of Geomagnetism* : The major efforts of the Institute would be in the areas of space geomagnetism, solid earth studies and aeronomy. Several infrastructural facilities are proposed to be created, like a computer centre, a regional geo-physical centre, workshop facilities unit for Antarctica studies, network of micropulsation recording stations, etc.

Scientific and Industrial Research

17.239 The Department of Scientific and Industrial Research (DSIR) was created in January, 1985 as a part of the Ministry of Science and Technology.

All matters concerning the Council of Scientific and Industrial Research (CSIR), National Research Development Corporation (NRDC), Central Electronics Limited (CEL), National Information System on Science and Technology (NISSAT) and a few schemes relating to technology promotion, development and utilisations, etc., transferred from the DST, are now under the purview of DSIR. This Department has been set up with a view to bringing about greater coordination between scientific research and industrial development, and to establish close linkages between the national laboratories of the CSIR and the major socio-economic Ministries/Departments.

17.240 *Council of Scientific and Industrial Research* : The overall strategy of the Council of Scientific and Industrial Research (CSIR) will be to consolidate, strengthen and modernise the existing infrastructure, and to initiate and implement nationally identified programmes and projects in collaboration with various S&T agencies, Ministries, Departments, public sector undertakings, universities and so on.

17.241 A 'derived' Plan component, i.e., specific R&D requirements of certain programmes and projects identified by the Ministries and Departments would also be carried out by the CSIR laboratories on the basis of specific funding.

17.242 CSIR will carry out exercises to identify the lacunae that have prevented some technologies developed by it from being utilised. New fields of activities would be preferentially taken up in frontier areas or on being funded by the end-users.

17.243 Efforts will be made to develop technology-packages including the necessary design and engineering inputs, for which end-users and engineering consultants will be associated with the CSIR efforts.

17.244 Design engineering capabilities will be enhanced in concerned laboratories. Wherever necessary, pilot plant facilities will be created.

17.245 It is proposed to complete the establishment of the Institute of Microbial Technology, Chandigarh, Centre for Cellular and Molecular Biology, Hyderabad, Regional Research Laboratory, Bhopal, a new campus of Structural Engineering Research Centre at Ghaziabad and CSIR Complex at Palampur, Himachal Pradesh. Laboratories will be encouraged to carry out forecasting and futuristic studies, so that they can plan their programme and activities well in advance.

17.246 Modelling and simulation studies, and computer-aided and optimisation studies would also be carried out.

17.247 Planning, monitoring and evaluation of projects and activities would be intensified, policy studies and studies on the impact of science on society, technology assessment and studies on national and international research trends would also be undertaken.

17.248 Special programmes on the inculcation of scientific temper and awareness, and involvement of younger scientists in the S & T programmes, are also envisaged.

17.249 An effort would be made to forge linkages between national laboratories and importers of technologies and especially with the in-house R & D centres of the public sector enterprises so that imported technologies would not only be absorbed and adapted but also updated. In each area at least one technology will be identified and developed to international acceptable standards, in cooperation with identified users of technology, so that each technology mission could be accomplished.

17.250 CSIR will continue to support extramural research in universities and other institutions of higher learning by providing fellowships and associateships and grants for research schemes, particularly in emerging areas.

17.251 Modern concepts of R & D management, project selection and monitoring, and cost control and systems to support them, will be introduced both in the national laboratories and at CSIR headquarters.

17.252 The important areas to be taken up in the Seventh Plan are : geophysics ; ocean science and technology ; petroleum ; coal ; renewable sources of energy ; chemicals and petrochemicals ; drugs and pharmaceuticals ; oils and fats ; electrochemistry ; natural products (cultivation and processing) ; health and applied biology ; biotechnology, cellular and molecular biology ; food and post-harvest technology ; leather ; housing, buildings and roads ; roads and transportation ; structure ; machinery development ; metallurgy and metals ; corrosion ; mining ; environmental technology ; glass, ceramics and refractories ; aeronautics ; computer-aided studies in chemical sciences and technology for rural areas.

17.253 Some selected areas where basic research will be pursued are : radio sciences ; material sciences ; electronics ; geophysics ; chemical sciences ; cellular and molecular biology and chemical biology.

17.254 *Activities of the DSIR* : One of the major efforts of the DSIR would be directed towards technology promotion, development and utilisation programmes. This would involve promotion and financial support of industrial research by and in industry ; measures for utilisation of indigenously developed technologies ; special programme for enhancing technology absorption and adaptation ; technology evaluation and demonstration, etc. In this process, consultancy services will be encouraged to assist transfer and trading in technology.

17.255 A national register of foreign collaborations

will be maintained as part of these programmes.

17.256 The activities of the NRDC and R&D efforts of CEL would also be strengthened. It is also proposed to build up S&T information system in a more effective way through the network of NISSAT.

Medical research

17.257 The Indian Council of Medical Research (ICMR) is the apex body for the formulation, coordination and promotion of biomedical research. The programmes are implemented through its permanent research institutes, centres of advanced research, research units, national multi-centric coordinated research programmes and research that it supports in institutions and universities. The research priorities have been identified according to the national health priorities, viz., control of communicable diseases (tuberculosis, leprosy, malaria, filariasis, cholera, typhoid and other enteric disorders, virus diseases); fertility control; programmes for maternal and child health and support for the expanded programmes of immunisation; control of nutritional and major metabolic disorders; strengthening of epidemiology and developing alternative strategies for health care delivery through the primary health care approach, for the fulfilment of the goal of Health for All by 2000 AD.

17.258 *Seventh Plan-Strategy* : In the Seventh Plan a conscious effort would be made to focus attention on the following strategies :

17.259 The thrust areas selected should be in congruence with the National Health Policy and the 20-Point Programme.

17.260 The task force approach that served well in the Sixth Plan would be pursued in the Seventh Plan, with further refinement in the light of past experiences (and mistakes).

17.261 Studies would be undertaken to enlarge the scientific basis of preventive medicine and health promotion; for example, demonstration projects with clearly defined objectives, methodologies and evaluation would be undertaken to serve as fore-runners for wider application in the health care system.

17.262 Simplified tests, which are specific and accurate for early recognition of diseases, and mass-applicable, would be developed; for example, immunodiagnostic tests offer a whole new horizon for the study of the epidemiology of several rampant diseases, and for monitoring and evaluation of control measures.

17.263 Product development in the field of health has been a serious bottleneck in India, so far. A product development cell would therefore be established, not only for evaluating and validating promising products, but to take selected products to the commercial stage, with the help and guidance of professional experts in the field. It would also be necessary to establish centres for controlled clinical trials of the new products.

17.264 Close and effective linkages with social and behavioural-scientists and communication experts would be established, with a view to enhancing the effectiveness and acceptability of health technologies.

17.265 Problem-oriented and problem-solving research would be actively pursued. Pragmatic, result-oriented, 'do-it now' type of research programmes would be developed.

17.266 The Seventh Plan strategy would display a multidisciplinary approach to most of our health problems.

17.267 *Linkages* : Linkages between the biomedical research system and the health care system in the whole area of health services research would receive high priority. Special attention would be paid to linkages with industry.

17.268 *Infrastructure development* : The most critical element of the research infrastructure is the researcher. Greater efforts would be made to attract talented young people to a career in scientific research.

17.269 Greater attention would be paid to infrastructural facilities such as laboratory animals, and tissue and cell culture facilities. A proper balance in the available research manpower across different disciplines will be ensured, and multi-disciplinary groups established.

17.270 A proper foundation for Health Services Research would be laid for application of available knowledge. For this purpose, the development of epidemiological skills and other fields such as operational research, systems analysis and data processing technologies would be needed.

17.271 The cutting edge of biomedical research today and in the near future lies in the new biology, i.e., immunology, cell biology, molecular biology, genetics including genetic engineering, hybridoma technologies, etc. Genetic engineering today represents a culmination of human creativity with great potential for human well-being, especially in the tropical areas. Special attention would be paid to this area.

17.272 Many of the diseases prevalent in India can be attributed to social, cultural and economic factors. Much can be achieved through a process of education on how human behaviour impinges health.

17.273 It is planned to abandon lines of research which are no longer relevant to our developmental goals or are unproductive.

17.274 The development of any new drug|device takes an unduly long time—almost 7—10 years. Efforts would be made to shorten this time by reducing the pre-clinical toxicology period, and by moving into programme introduction phase when the interim results show promising trends. This would be done

without sacrificing safety and ethics.

17.275 *Interaction with State Governments* : One point of criticism has been that there is not sufficient interaction with the State Governments in research activities sponsored in the States by the Agencies. Efforts were made in the Sixth Plan to establish bridges with the State Governments. The integrated control of filariasis in Pondicherry is a good example. This programme would be further augmented.

17.276 *Task forces* : Task forces, multi-centric studies and networking of institutions proved to be effective strategies for mobilising talent throughout the country and for injecting a sense of urgency into research projects. These approaches will be further developed.

17.277 The global revival of interest in research on traditional medicine will be reflected in the efforts of ICMR in the Seventh Plan. The need for scientific and pragmatic inter-agency programmes in this field is emphasised.

17.278 *Information systems* : Informatics and communication (including publication) will be intensified and augmented in order to bridge the existing gaps between researchers, health planners, policy makers and providers of health services as well as the users. Efforts will be made for regular feedback among these categories of personnel.

17.279 Under non-communicable diseases, the thrust areas would cover mental health, cancer research, neurological sciences, occupational health, cardiovascular diseases and blindness.

17.280 *Other programmes* : Other programmes would include basic research in many areas, health care of tribal and other underprivileged sections of the population, prevention and therapy of disabilities and rehabilitation, high altitude research health services research, basic research in new biology and other areas, traditional medicine, etc. These areas are of vital importance and of relevance to ensure the success of the Health for All Scheme by 2000 A.D.

17.281 With the momentum gained in the Sixth Plan, ICMR is now poised to take more rapid strides in providing R & D support for the fulfilment of the national health policies. Health systems research as well as basic and clinical research will need to be developed in a selective, balanced and effective manner.

17.282 A conscious effort will be made to enlarge the scientific base of preventive medicine and health promotion. Quality and relevance will be the watchwords of the Seventh Plan.

Forensic Science

17.283 Activities in the area of Forensic Science fall within the purview of the Ministry of Home Affairs. The Forensic Science laboratories are required to provide high quality and reliable data, often at short notice, for use in legal proceedings. The Central Forensic Science Laboratories are located at New Delhi, Calcutta, Chandigarh and Hyderabad. The first is under the control of the CBI, and the other three are under the Bureau of Police Research and Development.

17.284 The Institute of Criminology and Forensic Science imparts training in various aspects of criminology and forensic science, through short-term courses, etc. There is an important area of scientific examination of documents under the Bureau of Police Research and Development. The overall work in all these establishments cover : drugs and poisons; residues from arson; food poisoning; analysis of rapes, metallic residues and trace elements profile analysis; ballistics; bio-assays; pattern recognition including fingerprints; microscopic examinations investigation of materials due to a sabotage, detection of forgery in signatures, handwriting; etc.

17.285 In all these areas, techniques and methodologies have undergone redical changes with advances in science and technology. With modern techniques, it is possible to carry out microanalysis, for instance, at exceedingly low levels, with very low signal-to-noise ratios, speedily and very reliably. It is clear that these institutions require sophisticated scientific inputs.

17.286 During the Seventh Plan period these institutions have to be developed as S & T institutions which can function better in an independent autonomous fashion than as subordinate/attached offices. They will need to be modernised in terms of equipment and manpower capabilities. There would be need for appropriate expert advisory committees which can go into details of the equipment, staffing, etc., required, to review the scientific programmes and capabilities, and ensure linkages with related areas of activity and capability in the country. There is need to carry out research on a multidisciplinary basis and oriented to problems peculiar to the country. Appropriate linkages would have to be established between the Central Laboratories and the State Forensic Science Laboratories; the latter are managed by the respective State Governments, and the more recent ones are better equipped. All these laboratories have a very important role to play in the areas relating to law and order; they cannot perform this role without substantial and continuous inputs of modern science and technology.

Police wireless

17.287 Telecommunication is of paramount importance for the police force, and it contributes very substantially to their efficiency and efficacy. One of

the systems proposed in this connection would use INSAT to establish interconnections between a large number of 'Hubs'. Some of the major facilities to be introduced|used are : teleprinter communications or radio (RTTY) using intelligent terminals, etc. for transmission of messages with high speed over the RTTY links; mobile earth stations at sensitive places for establishing emergency communication links at very short notice through satellite between Delhi and the rest of the country multi-access mobile radio systems with dialling facilities in metropolitan cities to provide communication between mobiles and also to control stations or public communication networks; and solar panels as alternative sources of power supply in border areas and other isolated places. A technical expert group would be set up to examine the possibility of using meteor-burst communication links between State capitals, etc. Linkages with P & T, Department of Space, Department of Electronics, IITs and CSIR laboratories would be established.

S&T Component of various socio-economic sectors

17.288 It has been stated earlier that one of the major efforts during the Seventh Plan period would be to ensure that S & T is regarded as an integral component of the plans and programmes of all major socio-economic sectors. A large number of thrust areas|programmes to be taken up during the Seventh Plan have been identified in the major sectors; these are reflected under the respective Chapters in this Plan document. It has been suggested that Standing Science and Technology Advisory Committees and Empowered Committees be set by the concerned Ministries and Departments identify, analyse and formulate specific propos In the implementation of the S & T missions, socio-economic Ministries would be very clos associated.

17.289 The Steering Group on Science and Te nology has identified a large number of S & missions; these need to be implemented on a pi rity basis. In this endeavour, it is suggested t the Ministries make the fullest use of the exist research and development structures and spon research programmes of relevance to their act ties to the national laboratories so that the av able financial outlays and the existing infrastruct would be fully utilised.

Outlays

17.290 Government has accepted, in princip that the budget of all S & T departments|agenci institutions (Plan and Non-Plan), should be formu ted each year on the principle of zero-base budg ing. This will ensure that the most important ta will receive the highest priority and allocation. detailed procedure to introduce this system from t Seventh Plan period is under finalisation. The pl outlays for DAE, DOEn, DOD, DST, DSIR, DO and Forensic Science and Police Wireless are giv in Annexure 17.2.

17.291 For the S & T component of major soc economic Ministries and Departments, wherever has been possible to indicate, specific allocations a given in Annexure 17.3.

Illustrative List of Science and Technology Missions

Sl. No.	Missions	Main implementing/collaborating agencies/ departments.
(1)	(2)	(3)
1.	Integrated (R&D) Oilseed Development Project-self-sufficiency in oilseeds	ICAR/NBTB, DBT (IMD), DOS, Min. of Agriculture.
2.	To increase production, and provide security in dryland farming areas through improvements in weather forecasting, new uses of space technology for remote sensing and communication, development of agrometeorological services.	DST (IMD)/ICAR, DOS, Min. of Agriculture & Rural Development.
3.	Control/eradication of major diseases by immunoprophy laxis.	NBTB,ICMR, Ministries of Chemicals & Fertilisers and Health.
4.	Cattle herd improvement and increased milk production through embryo transplantation technology.	NBTB, ICAR, Min. of Agriculture.
5.	Linking up of all habitations in the country through an efficient system based on modern communications technology.	Deptt. of Tele-communications, DST, DOS, I & B DOE etc.
6.	Voice and visual pattern recognition input device development.	Deptt. of Electronics, DAE (TIFR), Indian Statistical Institute, Calcutta.
7.	Action Plan for prevention of pollution of Ganga.	DOEn, Central and State Institutions.
8.	Integrated vector control in different parts of the country against malaria, filariasis and other vector-borne diseases.	ICMR, NMEP, Min. of Environment and Forests, ICAR, DNES and state departments.
9.	Control of iodine deficiency disorders in U.P.	IDD Eradication Commission, Ministries of Health, Industry, Railways, State Departments.
10.	Production of immunodiagnostics-leprosy as a prototype.	ICMR, DST, Min. of Health.
11.	Immunological approaches to contraception	ICMR, NII, PGI ,Chandigarh, IISc, Bangalore, CDRI, Lucknow, NIHFW, New Delhi.
12.	1.2 Micron technology by 1990.	Deptt. of Electronics, DRDO, DSIR, DOS, DST.
13.	Development of thin film amorphous silicon solar cell technology.	Solar Energy Centre/DNES, BHEL, CEL BEL, NCL, Pune, IIT Delhi, IACS Calcutta, NPL New Delhi, University of Pune, DST.

ANNEXURE 17.2

Anticipated Expenditure for the Sixth Five Year Plan and outlays for the Seventh Five Year Plan 1985-90

(Rs. crores)

Sl. No.	Sectors	Sixth Five Year Plan (anticipated expenditure) 1980-85	Seventh Plan outlay 1985-90			
			Total	Centre	States	UTs
1	2	3	4	5	6	7
1.	Atomic Energy (R & D)	234.59	315.00	315.00	—	—
2.	Environment and Ecology/Prevention and Control of Air and Water Pollution and Ganga Action Plan	40.05	427.91	350.00	75.71	2.20
3.	Ocean Development (S&T)	87.04	100.00	100.00	—	—
4	Science and Technology	269.93	543.09	458.43	81.57	3.09
	(a) Meteorology	47.22	88.78	88.78	—	—
	(b) Science and Technology	137.27+	429.66	345.00	81.57	3.09
	(c) Meteorology Component of INSAT Space segment*	85.44	24.65	24.65	—	—
5.	Scientific and Industrial Research	221.71	355.00	355.00	—	—
	(a) CSIR	220.36	335.00	335.00	—	—
	(b) Schemes transferred from DST to DSIR	1.35†	20.00	20.00	—	—
6.	Space (S&T)	304.56	700.00	700.00	—	—
7.	Forensic Science and Police Wireless	—	25.00	25.00	—	—
	TOTAL	1857.88	2466.00	2303.43	157.28	5.29

Notes : +Including Rs. 35.07 Crores under States/UTs.

*The Department of Space has operational/budget responsibility for this programme.

†RE for 1984-85 only. This does not include Rs. 25 lakhs for TAAS which was transferred to DSIR later on.

CHAPTER 19

MINIMUM NEEDS PROGRAMME

Introduction

19.1 The Minimum Needs Programme was introduced in the first year of the Fifth Five Year Plan. The objective of the Programme is to establish a network of basic services and facilities of social consumption in all the areas upto nationally-accepted norms, within a specified time-frame. The programme is designed to assist in raising living standards and in reducing the regional disparities in development. The programme is essentially an investment in human resources. The basic needs of the people identified for this programme are Elementary Education, Adult Education, Rural Health, Rural Water Supply, Rural Roads, Rural Electrification, Rural Housing, Environmental Improvement of Urban Slums and Nutrition.

Review of the Sixth Plan

19.2 The programme continued with greater vigour and substantially large outlays were allocated during the Sixth Plan. A sum of Rs. 5,807 crores was provided in the Sixth Plan for this programme, of which Rs. 4,924 crores was allocated to the State sector and Rs. 883 crores to the Central Sector. As against the above outlay, an estimated expenditure of Rs. 6547.05 crores has been incurred during the period 1980—85. Of this, Rs. 5265.33 crores has been in the State sector and Rs. 1281.72 crores in the Central sector. Component-wise outlays and expenditure during the Sixth Plan period are given in Table 19.1.

Programmes

19.3 *Elementary Education* : In the field of elementary education, the basic objective is to achieve universal elementary education as early as possible. In the Sixth Plan, an enrolment target of 18 million additional children had been set up, against which the achievement is reported to be nearly 22 million.

TABLE 19.1

Minimum Needs Programme

(Sixth Plan Outlay and Expenditure)

(Rs. crores)

Sl. No.	Programme	Outlay 1980-85	Expenditure				1984-85	
			1980-81	1981-82	1984-85	1983-84	Outlay	Anticipated expenditure
1	2	3	4	5	6	7	8	9
1.	Elementary Education	851.00	97.94	108.18	143.43	196.54	256.01	281.87
		+54.00	+4.80	+7.44	+9.26	+14.71	+22.61	+25.9
2.	Adult Education	68.00	9.38	9.89	11.28	17.38	21.40	22.79
		+60.00	+6.08	+8.92	+14.48	+25.02	+40.00	+41.20
3.	Rural Health	408.00	48.05	62.84	67.53	91.68	109.76	113.19
		+169.00	+19.57	+24.30	+32.87	+44.65	+63.43	+61.78
4.	Rural Water Supply	1407.00	211.91*	259.54*	307.79*	360.51	366.08	358.15
		+600.00	+99.00	+100.00	+151.45	+265.71	+292.50	+292.50
5.	Rural Electrification	301.00	43.41	51.04	52.94	54.63	46.20	47.23
6.	Rural Roads	1165.00	203.25	232.18	204.15	308.79	211.78	313.24
7.	Housing for Landless Workers	354.00	54.54	76.54	92.31	110.51	119.71	92.64
8.	Improvement of Urban Slums	151.80	21.69	25.52	27.15	35.23	42.33	41.34
						+12.00	+10.00	+10.00
9.	Nutrition	219.00	28.58	35.37	68.41	117.79	139.72	146.98
	Total : State Sector	4924	718.75	861.10	974.99	1293.06	1312.99	1417.43
	Total : Central Sector	+883	+129.45	+150.66	+208.06	+362.09	+428.54	+43146
	GRAND TOTAL	5807	848.20	1011.76	1183.05	1655.15	1741.53	1848.89

*Tentative + Represents Central outlay/expenditure.

However, a realistic estimate of enrolment under the formal system of elementary education would be between 18 and 20 million.

19.4 Of the children in the age-group 6—11 years who were not in school, 73 per cent happened to be girls. Moreover, nearly 80 per cent of these children are to be found in the nine States of Assam, Andhra Pradesh, Bihar, Jammu & Kashmir, Madhya Pradesh, Orissa, Rajasthan, Uttar Pradesh and West Bengal. Thus, the bulk of non-starters and drop-outs continued to be girls. Moreover, the problem of non-achievement of universalisation is concentrated in the above-mentioned nine States only. Special efforts therefore need to be made to reach the backward and remote areas and more socially and economically disadvantaged groups, especially girls.

19.5 As far as non-formal education is concerned, against the Sixth Plan target of 8 million additional children, only 3.5 million children have been covered under this programme. Since this is an experimental programme, new methods will have to be devised to suit the requirements of specific areas and beneficiary target-groups.

19.6 *Adult education* : The Sixth Plan had set out a goal of 100 per cent literacy in the productive age-group 15—35 years by 1990 as a part of the Minimum Needs Programme. No definite physical targets had been laid down for this programme, yet, keeping the objective in view, as many as 386 rural functional literacy projects, 380 voluntary agencies, 49 universities and 13,000 centres of adult education were associated with this programme. It is estimated that 20 million persons might have been covered under the programme during the Sixth Plan period out of an estimated 100 million adult illiterates.

19.7 *Rural health* : With a view to providing health care facilities to all by 2000 A.D., the infrastructure in the rural areas has been expanded and strengthened during the Sixth Plan so that health care would reach the vast segment of the population living in the villages. The establishment of health sub-centres, which constitute the nuclei at the grass-root level to provide preventive and promotive health care measures in addition to family welfare and maternity child health care facilities, has continued to be given high priority. Against the target of 40,000 sub-centres, the likely achievement during the Plan period is 35,509. The shortfalls have been in the States of Himachal Pradesh, Karnataka and Madhya Pradesh.

19.8 Against the Sixth Plan target of 1600 primary health centres (including subsidiary health centres), the achievement has been 3702, which is more than two-fold. This has been largely due to the State of Maharashtra augmenting its primary health care facilities in a number of rural dispensaries during 1984-85. The States of Karnataka, Uttar Pradesh and West Bengal were not able to fulfil the target set for them.

19.9 Under the community health centres scheme the likely achievement as at the end of 1984-85 is reported to be 400 as against a target of 174. All the States continued to accord high priority to the setting up of community health centres.

19.10 Despite extensive infrastructure, the States have not been able to provide adequate number of doctors, nurses and other paramedical staff in the health care units set up under the programme. This has been mainly due to the fact that trained staff has not been available. Accordingly, financial assistance has been ensured to the States to train paramedical staff in the categories where shortages persist.

19.11 Under the village health guide scheme, 3.72 lakh health guides were trained and positioned in 4170 primary health centres (against a target of 4810 primary health centres) under the Programme till the end of 1984-85. But the training of unipurpose health workers for convering them into multi-purpose workers received a setback because the States were not able to resolve issues relating to unification of cadres and rationalisation of pay scales of multi-purpose workers.

19.12 *Rural water supply* : The Sixth Plan target was to cover all problem villages with at least one source of water supply. Out of the total 2.31 lakh villages identified as problem villages, all except 39,000 problem villages and 47,000 other villages are estimated to have been provided with water supply facilities by the end of the Sixth Plan. This means that a total of 299.78 million rural population has been covered by rural water supply schemes. This achievement was possible only due to larger investment than originally envisaged. As against the initial proposed outlay of Rs. 2007 crores, the actual expenditure has been Rs. 2485.33 crores—Rs. 1566.68 crores in the State Sector (MNP) and Rs. 918.65 crores in the Central Sector (ARP)[1] including Rs. 116.11 crores under the Incentive Bonus Scheme.

19.13 *Rural housing* : A scheme for Rural House Sites-cum-Construction Assistance was in operation in the Sixth Plan as a part of the Minimum Needs Programme. The number of landless families provided house sites is estimated at 13.07 million as against 12.21 million reported to be requiring houses by the State Governments. The achievement has been more than the target due to coverage of beneficiaries belonging to higher income strata and the scheme having been extended to smaller municipa-

1. Accelerated Rural Water Supply Programme

lities also. State-wise analysis reveals that there are still 0.72 million landless families to be provided with house sites.

19.14 As regards construction assistance, 19 lakh families were assisted against the target of 36 lakhs. The reason for lower performance under the programme is due to the fact that the Sixth Plan had envisaged a modest level of Government assistance under the scheme, whereas many of the State Governments exceeded the norms of assistance for each unit of housing.

19.15 *Rural electrification* : With the overall objective of covering at least 60 per cent of the villages in each of the States and Union Territories under the rural electrification programme by 1990, a target of 46,464 additional villages had been fixed for the Sixth Plan under the MNP. The actual achievement, however, has been placed at 34,489 villages.

19.16 Besides, MNP villages are also being electrified under non-MNP programmes of the States and Union Territories and of the Rural Electrification Corporation. While MNP target could not be achieved in full for a variety of reasons, the overall achievement of village electrification during the Plan was 1.28 lakh villages as against the target of one lakh.

19.17 *Rural roads* : The Sixth Plan envisaged linking of all villages with a population of 1500 and above and 50 per cent of the villages with a population of 1000—1500 within a time-frame of ten years ending 1990. As against a target of linking 20,000 villages with a population of more than one thousand, during 1980—85, the achievement has been only 18,000 villages. There is still a balance of 21,149 villages on an aggregate basis yet to be linked. However, there are wide variations among the States in this sector. The States of Andhra Pradesh, Himachal Pradesh, Orissa, Rajasthan, Tamil Nadu and Uttar Pradesh are lagging far behind the national average.

19.18 *Environmental improvement of urban slums* : The long-term objective, as laid down in the Sixth Plan, had been to cover 100 per cent of the slum population by 1990 under the scheme of environmental improvement of urban slums. By March 1985, about 15.6 million slum-dwellers would have been benefited under the programme out of a total estimated slum population of 33.1 million.

19.19 *Nutrition* : Nutrition Programme under MNP includes (i) Special Nutrition Programme (SNP) and (ii) the Mid-day Meals Programme (MDM). The objective of the Special Nutrition Programme are to provide the beneficiary 300 calories and 8—12 grams of protein for the age-group 0—6 years, and 500 calories and 25 grams of protein for pregnant women and nursing mothers. During the Sixth Plan, nutrition support was provided to 11 million beneficiaries in the on-going 1136 Integrated Child Development Scheme Projects and SNP centres outside ICDS areas.

19.20 Under the programme of Mid-Day Meals (MDM) for school-going children in the age-group 6—11 years, about 20 million beneficiaries were getting nutrition support at the end of the Sixth Plan.

Strategy for the Seventh Plan

19.21 The major thrust of the Minimum Needs Programme in the Seventh Plan would be to integrate the programme with other rural development and anti-poverty programmes so as to create necessary linkages in the delivery services. The MNP comprises two distinct sets of activities : human resources development activities which cover elementary and adult education, health, drinking water supply, nutrition and rural housing, and activities relating to area development like rural roads and village electrification. The various components of the MNP seek to enhance the impact of both beneficiary-oriented and area development programmes of rural development. While the MNP increases the productive capacity of the community as a whole by indirect impact the rural development programmes improve the economic condition of the individual with a direct and personalised approach. The two sets of programmes are mutually supportive and, therefore, need to be linked.

19.22 Besides the development of linkage between the MNP and rural development and anti-poverty programmes, it is proposed to add some new components to the MNP during the Seventh Plan. These are domestic cooking energy, public distribution and rural sanitation. However, the programme guidelines for public distribution and rural sanitation are yet to be worked out. A total provision of Rs. 10081.72 crores has been made in the Plan as against the provision of Rs. 4924 crores for the Sixth Plan for the Minimum Needs Programme in the State Sector. The Central Sector outlay for the Plan has been envisaged at Rs. 1464.22 crores.

Programmes

19.23 *Elementary education* : The overall aim of universalisation of elementary education for children in the age group 6—11 years would get an overriding priority. For achieving the goal of universalisation by the end of the plan, over 50 million children would have to be additionally enrolled in the Plan period. This has to be achieved through a network of formal and non-formal systems so as to ensure basic minimum education to all children that will enable them to

acquire functional literacy to help them in their socio-economic activities. The additional enrolment in the Seventh Plan in full-time educational institutions has been envisaged at 25.53 million children of which 11.46 million would be boys and 14.07 million girls.

19.24 Non-formal education would form an important Plank for achieving universalisation of education and it would be expanded further and made acceptable with a variety of forms to suit the local needs. The Seventh Plan proposes to cover 25 million children under this programme. However, depending upon the progress of the scheme and actual experience, additional funds might be provided for the programme. The programme of non-formal education would be appropriately linked with the formal system of education.

19.25 *Adult education* : Eradication of adult illiteracy and the development of a programme of continuing adult education is a major thrust area in the Seventh Plan. The task of covering all the illiterates in the age-group 15-35 years by 1990 is a formidable one. Considering the fact that the motivation of the learner is crucial for the success of the programme, the strategy to achieve this can only be through a mass movement programme, involving political and social organisations, voluntary agencies, students, teachers and the public at large. The programme will also have to be linked with various other development programmes, specially Integrated Rural Development Programme. The active participation of institutions like village panchayats, mahila mandals, community centres etc. will be sought. The programmes of Nehru Yuvak Kendras and National Student Service (NSS) would also have special focus on eradication of illiteracy.

19.26 *Rural health* : Primary health care will be further expanded in the Seventh Plan, with emphasis on preventive and promotive aspects. Effective linking of health and health-related services like nutrition, safe drinking water supply, sanitation, housing, education and social welfare will be sought to attain the goal of health for all by 2000 AD.

19.27 During the Seventh Plan, the three-tier system of sub-centres, primary health centres and community health centres would be further strengthened. The existing rural dispensaries will be converted into primary health centres and sub-divisional hospitals into community health centres and new functional units will be set up wherever necessary. Construction works would be taken up in areas where rented buildings are not easily available. Adoption of low-cost models of housing for health centres would be accorded priority in the remaining areas. Multipurpose workers (MPW) scheme would be extended in a meaningful manner, with emphasis on qualitative training for ensuring attitudinal changes and developing the required skill among them. Effective deployment of trained personnel and rationalisation of pay scales of multi purpose functionaries by the States would be an important aspect. Community participation in health programmes will be encouraged by activising village Health Committees, and involving block and district level panchayats in planning, organising and running of health services. The participation of voluntary organisations in delivery services of health care would be promoted by financial assistance.

19.28 The following targets have been fixed under the Minimum Needs Programme for the Plan period

Programmes	Total requirements	Number likely as on 1-4-85	Targeted addition during 1985-9
1. Sub-centres	1,37,000	83,000	54,00
2. Primary Health Centres	23,000	11,000	12,00
3. Community Health Centres	5,417	649	1,55
4. Training MPW (Female)	1,30,000	80,000	60,00
5. Training MPW (Male)	1,30,000	80,000	60,00

As regards construction of buildings for the sub centres, primary health centres and community health centres, the following targets have been set in the Seventh Plan :

Programmes	Number likely by 1989-90	Centres having buildings of their own by 1-4-85	Construction works projected in Seventh Plan	Percentage ow building by end o Seven Pl
1. Sub-Centres	1,37,909	33,475	23,837	41
2. Primary Health Centres/ Subsidiary Health Centres.	23,491	8,578	10,057	79
3. Community Health Centres	2,202	547	1,539	97

A sum of Rs. 750 crores is also provided for Village Health Guides Scheme and maintenance of Sub-centres which will further supplement efforts to promote health services in rural areas.

19.29 *Rural water supply* : In spite of massive efforts in the Sixth Plan, there are still a sizeable number of problem villages which have no source of potable drinking water. Identified problem villages based on the existing criteria will have to be covered before other villages are taken up. Once this target is completed and every village is provided with at least one source of water supply, facilities will be further expanded with a view to providing adequate wa

supply, and this will require liberalisation of present norms. Attempts will be made to cover all those villages which do not have assured sources of water supply within a distance of 0.5 km. The per capita norm for water supply in rural areas will also have to be enhanced from 40 litres per capita per day to 70 litres per capita per day. This will require provision of more hand pumps and the capacity of piped water supply schemes will also have to be increased. For benefiting the poorer classes of society like scheduled castes, scheduled tribes and landless agricultural labourers, additional sources|water collection points will be provided to enable them to have access to safe drinking water. The drought-prone areas will be paid due attention. For maintenance of water supply facilities in rural areas, 10 per cent of the total MNP funds are being earmarked.

19.30 A total outlay of Rs. 3454.47 crores has been envisaged for rural water supply programme in the Seventh Plan.

19.31 *Rural electrification* : During the Seventh Plan, the Minimum Needs Programme aims at ensuring a coverage of 65 per cent of villages in all the States and Union Territories at the end of 1989-90 under Village Electrification. The States which require more intensive efforts are Assam, Bihar, Madhya Pradesh, Orissa, Uttar Pradesh, West Bengal and North Eastern States. The priority areas for rural electrification under MNP have been identified as follows :

(i) All North-Eastern Hill States and Union Territories, viz., Meghalaya, Tripura, Assam, Manipur, Nagaland, Sikkim, Arunachal Pradesh and Mizoram;

(ii) Districts in other States with less than 65 per cent of electrification, the districts having the least percentage of electrification being covered first;

(iii) All areas included in Tribal Sub-Plan.

19.32 The total cost of the programme during the Seventh Plan has been estimated at Rs. 497.08 crores, to cover 40,285 villages.

19.33 *Rural roads* : During the Seventh Plan, about 24000 villages are to be connected with road links so as to achieve the national target under MNP. While connecting villages with population of more than 1000, it is envisaged that requirements of villages with less than 1000 population will also be taken into account. At the time of planning roads' linkage, efforts will be made to connect as many small villages which lie en route as possible.

19.34 During the Seventh Plan, the rural roads component of the MNP will pay particular attention to hilly, tribal and desert areas. Norms for these areas will be liberalised as follows :

(i) Hill areas

(a) 100 per cent linkage during 10 years' time frame to villages with population ove 500.

(b) 50 per cent linkage during 10 years' time frame to villages with population betwee 200 and 500.

(ii) Tribal, coastal and desert areas

(a) 100 per cent linkage during 10 years' time frame to villages with population over 100

(b) 50 per cent linkage during 10 years' time frame to villages with population 500-100

Norms for areas other than hill areas, tribal coastal and desert areas are :

(a) 100 per cent linkage during 10 years' time frame ending 1990 to villages with popula tion over 1500.

(b) 50 per cent linkage during 10 years' time frame ending 1990 to villages with popula tion 1000—1500.

19.35 A sum of Rs. 1729.40 crores has bee earmarked in the States Plans provision for the rur roads programme. Outlays under NREP[1] an RLEGP[2] would also be used as supplementary fun for construction of rural roads under MNP. The Sta Governments may also consider introducing speci funding schemes such as Market Committee Fur Scheme of Punjab and Haryana and Krishi Up Mandi Scheme of Rajasthan.

19.36 *Rural housing and landless labour* : At t end of the Sixth Plan, 0.72 million landless famili had been left uncovered. These families would covered on a priority basis in the Seventh Plan, f which a sum of Rs. 36 crores would be utilised.

19.37 Along with allotment of house sites, t scheme also provides assistance for construction. Du ing the Plan, efforts would be made to provide con truction assistance to those families already provid house sites. A target of 2.71 million families h been fixed for provision of construction assistance a total cost of Rs. 541 crores. The target can achieved only if the State Governments adhere to t norms and standards envisaged in the Plan.

19.38 The amount of assistance has been revis upwards. It is proposed to provide assistance to extent of Rs. 500 per family for provision of de loped house site of 100 sq. yards each, against current norm of Rs. 250. Similarly, for construct assistance, it is proposed to increase the amount

1 National Rural Employment Programme.
2 Rural Landless Employment Guarantee P gramme.

s. 2000 per family against the norm of Rs. 500 at resent.

19.39 Besides the provision of Rs. 577 crores made n the Plan for Rural Housing under MNP, an amount f Rs. 240 crores would also be available during the eventh Plan from institutions like Housing and Urban Development Corporation and General Insurance Corporation.

19.40 *Environmental improvement of urban slums* : The slum improvement programme will continue in he Seventh Plan with greater vigour and steps would be taken to provide security of tenure to the slum-dwellers so that they may develop a stake in maintaining and improving their habitat. Of the total urban population, about 17.5 million have yet to be provided relief under the scheme of environmental improvement of urban slums.

19.41 Per capita assistance which was only Rs. 120 in 1972 was stepped up from time to time and the present rate of Rs. 250 per head was fixed in 1984. Since then many State Governments have considered this quantum inadequate, and it has been decided to step up the per capita expenditure to Rs. 300. The total outlay under Environmental Improvement of Urban Slums Scheme in the State Plans works out to Rs. 269.55 crores. On the basis of per capita expenditure of Rs. 300, this outlay would benefit about 9 million slum-dwellers during the Seventh Plan, leaving a balance of 8.5 million to be attended to in the subsequent Plan.

19.42 *Nutrition* : The two components of the Nutrition programme, viz., Special Nutrition Programme and Mid-day Meals would be continued during the Seventh Plan. The Special Nutrition Programme, besides continuing the nutrition support to 11 million eligible people, would be further expanded to cover all the additional Integrated Child Development Scheme projects during the Seventh Plan. Measures would be taken to bring Special Nutrition Programme centres either within the ambit of the Integrated Child Development Scheme programme or to upgrade them by linking with other inputs like health, sanitation, hygiene, water supply and education.

19.43 Attempts would be made to ensure uninterrupted supply of required nutrition material for specified days in all the anganwadis|SNP centres. The unit costs would be revised to ensure required nutrients to the beneficiaries.

19.44 Under the Mid-day Meals (MDM) programme for school-going children, 20 million students were getting nutrition support at the end of the Sixth Plan. During the Seventh Plan, stress would be laid on the consolidation of the programme, by linking it with other inputs of health, potable water and improvement in environmental sanitation, rather than on numerical expansion.

19.45 The total outlay for the Seventh Plan has been fixed at Rs. 1731.73 crores as against the anticipated expenditure of Rs. 397 crores during the Sixth Plan.

19.46 *Rural domestic cooking energy* : Cooking energy forms nearly half of the total energy consumed in the country. The main sources of cooking energy in the rural areas are non-commercial, e.g., firewood, crop-waste and animal dung. The supply of these sources is rapidly dwindling and the Report of the Fuel Wood Committee (1982) has stated that fuel to cook food may soon become a greater constraint than the availability of food itself. Therefore, the two schemes of Rural Fuel Wood Plantation and provision of improved Chullahs which were in operation in the Sixth Plan, are proposed to be integrated and made an additional component of the Minimum Needs Programme during the Seventh Plan.

19.47 The programme of fuel wood plantation during the Seventh Plan would include distribution of about 100 crore seedlings to benefit at least 2 million rural families. It would be ensured that households covered by the scheme are provided adequate fuelwood for meeting cooking needs. The programme would be extended from 157 districts in the Sixth Plan to all the fuel wood-deficient districts in the Seventh Plan. Under the improved chullah programme, at least 50 lakh chullahs would be installed against an estimate of 8 lakh chullahs in the Sixth Pan. The Programme also envisages organisation of training courses in each district and improving the design and thermal efficiency of chullahs through applied research projects. Improved chullahs would be popularised among rural households through provision of appropriate subsidies and financial incentives.

19.48 An outlay of Rs. 165 crores has been provided for the Rural Fuel Wood Plantation Scheme in the Seventh Plan as against an outlay of Rs. 97.2 crores in the Sixth Plan. Rs. 25 crores have been provided for improved chullahs scheme in the Seventh Plan as against an outlay of about Rs. 6 crores in the Sixth Plan. These two schemes would be closely coordinated with the Rural Development Programme.

19.49 A suitable monitoring system would be deployed for ensuring that the two schemes are effectively coordinated and complement each other at the grass-root level.

19.50 Annexure 19.1 brings out the objectives and targets to be achieved by the end of the Seventh Plan under various programmes included under MNP. Annexure 19.2 shows the Seventh Plan outlays provided for MNP in different States.

Annexure 19.1

Minimum Needs Programme

Head	Objectives	Target by 1990
Elementary Education	100 per enrolment in the age-group 6—14 years by 1990. It would be supplemented with non-formal education.	A target of 25.53 million children for formal and 25 million children for non-formal education has been fixed.
Adult Education	100 per cent coverage of adults in the age-group 15—35 years by 1990 through non-formal education.	No target fixed.
Rural Health	1. Establishment of one sub-centre for a population of 5000 in the plains and 3000 in tribal and hilly areas by 2000 AD.	To establish 54000 sub-centres in addition to 83000 existing sub-centres so as to achieve the objective fully.
	2. One PHC for 30,000 population in plains and 20,000 in tribal and hilly areas by 2000 AD.	To establish 12,000 PHCs in addition to the existing 11,000 with a view to achieving the target fully.
	3. Establishment of one Community Health Centre for a popultion of one lakh or one CD Block by 2000 AD.	In addition to the existing 649 CHCs, 1553 more CHCs would be established for achieving 40.65 per cent of the target.
4. Rural Water supply		Coverage of all the remaining 39,000 problem villages as a priority item, after which other villages with inadequate supply of water will be taken up.
5. Rural Roads	Linking up all remaining villages with a population of 1500 and above and 50 per cent of the total number of villages with population of 1000 to 1500 by 1990.	A normative target of 20487 villages has been fixed having a population of 1500 and above and 3851 villages having population of 1000 to 1500.
6. Rural Electrification	At least 65 percent of the vlillages in each State and UT to be electrified by 1990.	A minimum coverage of 65 per cent of the villages is aimed at by all States and UTs at the end of 1989-90.
7. Housing Assistance to Rural Landless Laboourers	Provision of housing assistance to all landless labour households by 1990. Assistance to include house sites construction materials, drinking water well for a cluster of houses and approach roads.	Coverage of the remaining 0.72 million households for allotment of house sites to achieve 100 per cent target and provision of construction assistance to 2.71 million families already having house sites.
8. Environmental Improvement of Urban Slums	100 per coverage of urban slum population by 1990. Facilities to include water upply, sewerage, paving of streets, storm water drainage, community leterines. Areas inhabited by Scheduled Castes, particularly scavengers, to be given priority.	9 million slum-dwellers out of the remaining 17.5 million would be covered under the programme.
9. Nutrition		Nutrition support would be continued to 11 million eligible persons and the SNP will be expanded to all the ICDS Projects. MDM programme will be consolidated and linked to health, potable water and sanitation.